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- EARTH'S STEADILY DECAYING MAGNETIC FIELD
- NIETZSCHE'S SUPERMAN
- MISSING DECAY: AN ANALYSIS OF C-14
- THE LITTLE ICE AGE — PART 1

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Haec Credimus

For in six days the Lord made heaven and earth, the sea, and all that in them is, and rested on the seventh.—Exodus 20:11

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A Case of “Missing” Decay

An Analysis of C-14 Detected in Very Old Samples

Rick Sanders*

Abstract

Carbon-14 has historically been extremely useful for archeologists and Quaternary geologists. The recent development of accelerator mass spectrometry has dramatically improved the precision of the method. However, this new capability has raised questions. Many supposedly “ancient” carbon samples contain some level of radiocarbon content. The purpose of this paper is to provide a statistical analysis of published results of radiocarbon measurements made on geologically ancient samples to determine whether there are any significant patterns. The results show that C-14 levels in these ancient samples appear to follow the lognormal model, which entails that their ages follow a normal curve. This implies that all of the samples are of approximately the same age and points to a single burial event for all of them. The results are consistent with a global flood catastrophe and a young age for the earth.

Introduction

Radiocarbon (C-14) dating has grown rapidly as a science and an industry over the past several decades. This growth has been due in part to the development of ultra-sensitive detection equipment known as accelerator mass spectrometry, or AMS. This instrument is capable of detecting minute amounts of radioactive elements present within samples. However, this new technology has brought questions with it, for many geologically ancient samples have been tested and appear to contain trace amounts of radiocarbon. C-14 has a half-life of only 5730 years, which means any carbon sample older than around 100,000 years before the present (YBP) should contain zero radiocarbon. Obviously, if the C-14 found in these ancient samples is intrinsic, such samples cannot be multiple millions of years old. In fact, any such object would be limited to about the past 100,000 years at maximum. Creation scientists argue that the C-14 detected within these ancient samples is in fact intrinsic and provides evidence for a young earth. Critics argue that the observed radiocarbon cannot be intrinsic, since the objects are obviously too old to contain any C-14.

Recently, several important studies have been done by young-earth scientists that focus on this issue. Arguably, the most significant of these was conducted by the Radioisotope and the Age of the Earth (RATE) team as reported in Baumgardner (2005). These studies have attempted to show that many geological carbon samples that should be of “infinite” radiocarbon age in the secular paradigm actually contain small amounts of intrinsic radiocarbon. All such studies, including the RATE project, have been criticized by scientists who accept the standard geological timescale and the results have been

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ignored or dismissed (e.g., Bertsche, 2008; Isaac, 2007). Such criticisms are based on the fact that small amounts of background contamination are thought to occur in radiocarbon measurements. This background is cited to explain the apparent C-14 found in very old samples.

Carbon 14 originates in the upper atmosphere as cosmic rays bombard atmospheric molecules, which produce what are known as "fast" neutrons. These neutrons are able to enter into the nucleus of nitrogen molecules and convert them to radioactive C-14. Carbon in the atmosphere rapidly combines with oxygen to produce carbon dioxide, which can then be taken in by plants, absorbed into ocean water, or retained in the atmosphere. As can be imagined, if any factor in C-14 production is changed, its level in the atmosphere also will change. For example, if the sun has a period of unusually high activity, it can shield the earth from the cosmic rays, thus lowering the amount of C-14 creation. Human activities also can alter the ratio, as in the 1940s when atomic bomb testing created extra C-14 in the atmosphere. All of these factors can create a widely fluctuating C-14/C-12 ratio, which is why calibration is vital for properly understanding radiocarbon "ages." It is important to distinguish between the "radiocarbon age" and the "actual age" of a particular object. The former is the calculated age of a sample based on its radiocarbon content; the latter is its real age, which usually must be found by comparing the radiocarbon results with a calibration curve (see Figure 4).

Analysis of the Data

Statistical

What has been lacking in any of the research on the topic to date is an analysis of the data based on an appropriate statistical modeling technique. Such an analysis could potentially provide evidence for or against the hypothesis that C-14 found in ancient samples is due to contamination. Care must be taken, however, for a misuse of statistics can lead to unreliable conclusions. The results I am presenting grew out of a research project I conducted in the fall of 2009 on radiocarbon dating. Essentially, I have compiled a listing of radiocarbon measurements made on geologically ancient samples taken from results published in the literature. A histogram of the data is analyzed to find any statistically significant patterns. Finally, I draw some conclusions about the data based on the outcomes of the tests.

The purpose of this paper is (1) to determine if existing radiocarbon data fit any recognizable model, (2) to analyze the data in terms of any potential models, and (3) to draw some conclusions about radiocarbon content in ancient samples based on the proposed model. All of the statistical tests and graphs discussed below were prepared using Minitab 15, a statistical software program used by many statisticians and educators.

There were two sources for the radiocarbon data I used in producing this paper: two tables shown in Baumgardner (2005), including his summary of previously published results (pp. 596–597) and the RATE project results on coal (p. 605). The other source was a study by Snelling (2008).

There are several preliminary remarks that should be made about this sample set. First, I made an effort not to include samples that probably do not date to the time of the Flood in the young-earth paradigm. This would include samples such as diamonds and Precambrian (nonbiological) graphites. These objects were not utilized because they probably date to an earlier time than the Flood (possibly the Creation Week). Specifically, I excluded from my study graphite samples reported in Baumgardner (2005) measuring under 0.05 percent modern carbon (pMC), as well as all diamond samples (see Baumgardner, 2005, p. 594). Types of objects that were included in the study were coal, wood, shell, foraminifera, bone, fossils, and others.

The second point to be made is that this sample set is not comprehensive of radiocarbon content in all geologically ancient samples (by "geologically ancient" I mean any sample that dates older than about 100,000 years before the present in the old-earth paradigm). There are several reasons for this. First, there has been to my knowledge no rigorous and systematic study of radiocarbon content in ancient samples done by the scientific community. Second, information about the work that has been done is limited to those who have access to prestigious and expensive journals such as *Radiocarbon* that publish such work. Third, preparation and laboratory methods have changed in the thirty-some years of AMS radiocarbon dating. Thus some of the earlier research may not be reliable, or different methods may produce different results that are not consistent. The purpose of this paper is simply to provide a preliminary look at the general trends we see in the data and to suggest a possible explanation, as well as propose a future research direction.

Radiocarbon Data

I began by attempting to determine if the radiocarbon found in the geological samples fit any recognizable mathematical model, one that could be used to make predictions about future data. A histogram of all the data I have accessed with units in percent modern carbon (pMC), the standard measurement unit for radiocarbon dating, is shown in Figure 1. This histogram shows the number of samples on the vertical axis and the amount of C-14 in them on the horizontal axis. I used a distribution identification test in Minitab to identify all of the possible matches for the data. There were four possible matches in the test results: the lognormal, the loglogistic, the Box-Cox transformation, and the Johnson transformation. Of these four,

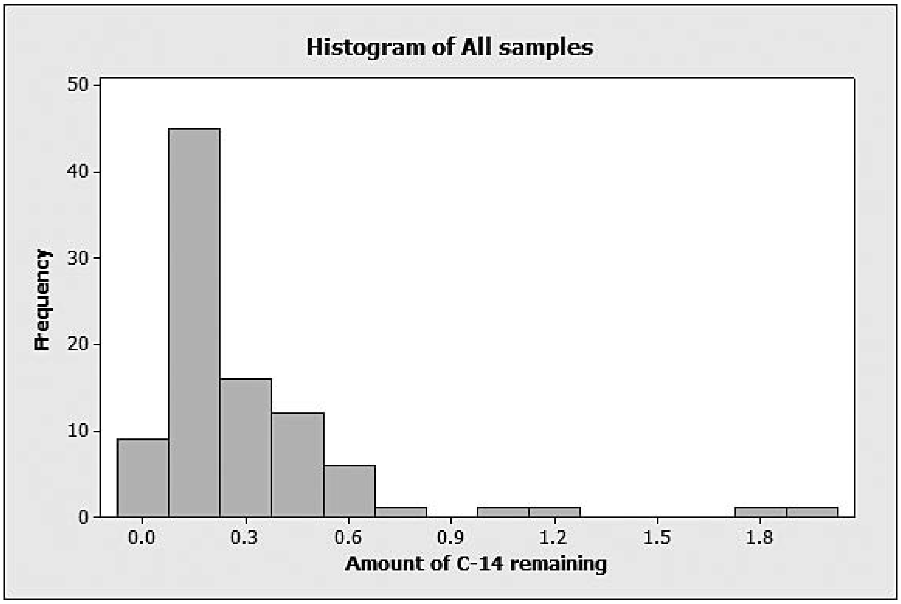

Figure 1. Histogram of radiocarbon levels in ancient samples showing the characteristic shape of the lognormal distribution. Note that none of the samples tested at a zero level; the bar above 0 represents those samples testing between 0.0 and 0.1. The minimum and maximum levels were 0.014 and 1.896 pMC. The median was 0.198 pMC.

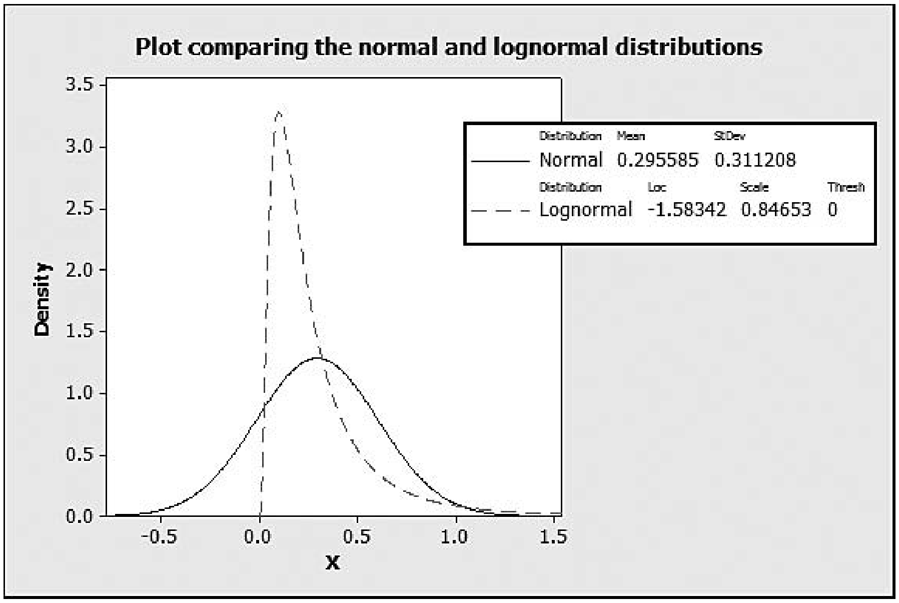

Figure 2. Probability plots generated in Minitab 15 that compare the lognormal and normal distributions. The scale for each of the curves is based on parameters from the actual data. Notice that the lognormal model approximates the pMC amount histogram much better than the normal model.

the Box-Cox and the Johnson are not actual distributions; they are merely data transformations designed to "fix" data so that it can be analyzed as a normal distribution. The shape of the loglogistic distribution is almost identical to the lognormal, but it is used specifically in binary response contexts and thus is probably not applicable to our scenario. I had suspected a lognormal distribution since first viewing the histogram, and it fits the context of exponential decay exactly. Figure 2 compares the normal and lognormal models using measurements taken directly from this data including average, standard deviation, etc. The lognormal model can be seen to approximate the histogram shown in Figure 1 much better than the normal curve.

A further test is possible: we take every value that we originally plotted in Figure 1 and take the natural logarithm, and then make a new histogram of this "transformed" data and run a normality test. I also did this test and obtained a p-value of 0.643. This p-value means that there is no evidence against the normality of the histogram. It is reasonable to conclude that the data follow the lognormal distribution.

We have seen that the lognormal distribution is a very good match for the radiocarbon data. The main characteristic of the lognormal distribution is that if we take the logarithm of each value and create a histogram of the results, we produce a *normal* distribution curve; hence the term "*lognormal*." This particular type of distribution occurs throughout the natural world, including geological contexts (Limpert et. al., 2001). Appendix 1 discusses some of the technical details of the lognormal distribution and the implications of this function in modeling radioisotope concentrations. That radiocarbon levels should follow a lognormal pattern is significant.

Recall from high school physics that the standard formula for radioisotope decay is $A = A_0e^{-\lambda t}$. A is the final, remaining amount of radioactive atoms, A_0 is the initial amount, T is the age of the sample in years, and the symbol λ is the decay constant for the material, equal to the natural logarithm of 2 divided by the half-life of the material, in this case 5730 years. However, in our case we know the final amount: the values that we plotted in the histogram in Figure 1. By rearranging the equation we can produce the formula for conversion of the amount of remaining radiocarbon to age in years before the present. Using 5730 as the value for the half-life, we find $1/\lambda = 8266$, and recognizing that A/A_0 is the same as pMC/100, we get the equation $T = -8266 \times \ln$ (C-14 content in pMC/100). Notice the natural logarithm present in this equation. By converting each data point to age in YBP, we produce the age graph shown in Figure 3.

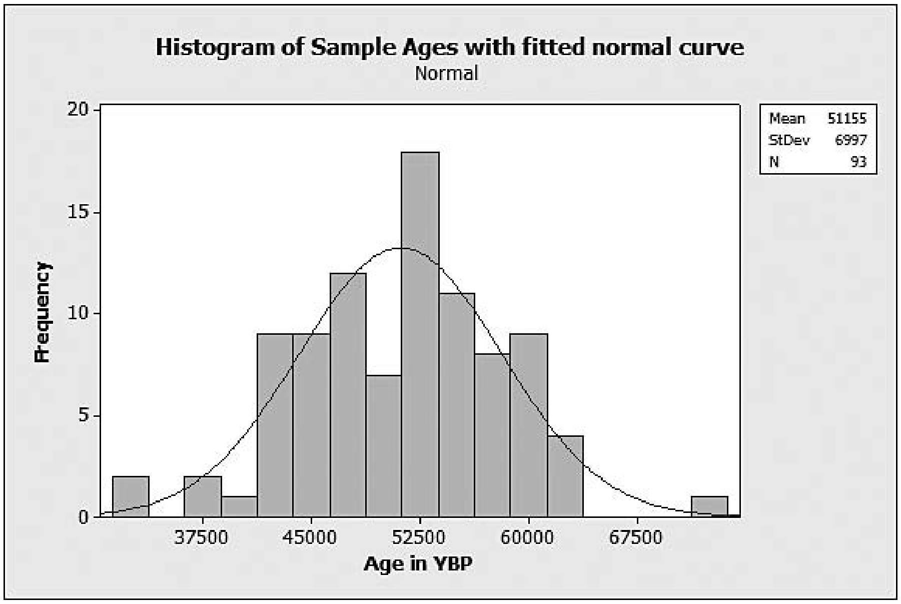

Figure 3. Histogram showing the "apparent" radiocarbon ages of the tested samples with a normal curve fitted to the data. The line shows how the apparent ages of the tested samples appear to conform to the normal distribution. The graph and line fit were done in Minitab.

Significance of the Age Graph-A Normal Distribution

To clarify, this graph is showing the "apparent C-14 ages" of all of the samples that were tested in the studies I mentioned above. These are *not* the actual ages of these samples but their apparent ages. Neither young-earth creationists nor secular scientists would conclude that these samples are in fact the ages shown. However, the pattern that we observe in the data is more significant than the actual ages. The histogram appears to follow a normal distribution pattern. A normality test confirms that it is possible this data comes from a normal population (The Anderson-Darling normality test gives a p-value of 0.643; again this shows that there is no evidence against normality). The histogram is showing the number of samples with a given age; the age is given on the horizontal x-axis and the number of samples with a particular age is shown by the vertical y-axis. A higher bar in the histogram means there are a greater number of samples with that particular age. Again, these are not actual ages but rather the "apparent" ages given by the radiocarbon dating method if radiocarbon levels had remained perfectly constant throughout history, which all scientists agree is not the case. Interested individuals may consult Levine et. al. (2001) or Miller and Miller (2004) for further study of the normal distribution.

The average apparent age of the samples is 51,155 YBP. The standard deviation is 6997 years. The 95% confidence interval for the mean is 51,155 ± 726 YBP. Once again, this is *not* a measure of the real average age but the apparent "radiocarbon" age. There are a number of ways to fit this age within a young-earth paradigm. The simplest is to infer that the C-14/C-12 ratio was much lower in the past relative to today's value. Plants and animals that were buried and preserved in the Flood sediments would therefore, when they died, begin with much lower C-14/C-12 ratios than is the case today. Reasons for lower C-14/C-12 ratio before the Flood could include a larger biomass exchanging with the atmosphere or a lower rate of C-14 production, perhaps due to a stronger magnetic field. Again, the normal curve pattern that we observe is more important than the actual apparent age.

The implications of these results are significant. One of the characteristics of the normal distribution is that "There is a strong tendency for the variable to take a central value" (StatSoft, 2010). The normal curve was first investigated when researchers such as Gauss and Laplace in the late eighteenth and early nineteenth centuries observed that measurement errors consistently fit a pattern that could be approximated by a continuous curve (Miller and Miller, 2004; Grower, 2008). Out of this insight has come the "normal" distribution.

Consider an example: a paper by Jull et. al. (1995) in the journal *Radiocarbon* presents the results of radiocarbon dating several of the Dead Sea Scrolls and linen fragments found in the caves of Qumran and other nearby sites. An example of one of the samples dated and the

Descriptive Statistics for Radiocarbon Data

Geometric mean (μ*)	Multiplicative s.d. (σ*)	Mean (μ)	Standard deviation (σ)
0.2053	2.3315	0.2956	0.3112

Table I. Summary of descriptive statistics for the samples that were used in this analysis. "S.d." is standard deviation. Notice that μ* is multiplied or divided by σ*, expressed by the notation μ*·/ σ*. This is different from the normal distribution, with notation of μ ± σ. This is a result of the lognormal distribution being multiplicative in nature, while the normal curve is additive.

Radiocarbon Age of Dead Sea Scrolls Parchment Sample

Sample	# of runs	C-14 Age (yr BP)	±1σ	±1σ age range
AA-13415	5	1954	38	AD 5–80

Table II. An example of a sample radiocarbon age as reported by Jull et. al. There were 5 runs taken, which gave five different ages that were averaged and the standard deviation calculated. The notation used is that of the normal distribution. Since the sample must be the same age as itself, several runs are taken in order to get a more accurate representation of the "true" radiocarbon age.

corresponding age with uncertainty is reproduced in Table II. For this particular sample, five runs or trials were made, each giving a particular age. These were averaged and the standard deviation calculated. This is what is represented by the notation ±1σ. The article also contains information on the ±2σ level of uncertainty for each date.

This article is but an example of the standard method of reporting radiocarbon ages throughout the literature—all use ±1σ, which is calculated from the several runs that are made. If only one run is made, resulting in only a single date, no standard deviation can be calculated because there is no spread to the data, there is only one point. Every sample must be the same age as itself, but due to the nature of experiments and environmental factors some variation can be expected within a sample. In other words, if several small pieces are broken off a larger sample and carbon dated, they will probably not all give the exact same level—they should be close but probably different. This "random error" is modeled by—none other than—the normal distribution.

This use of the normal distribution is further illustrated by the graph in Figure 4. This is an example of a calibration chart, used by scientists to calibrate the "radiocarbon age" from a sample to its real age. This is done because, as we noted earlier, historical fluctuations in the C-14/C-12 ratio in the atmosphere give variation in the actual radiocarbon levels in the past. The "radiocarbon age" of the sample is given on the vertical axis. Notice that on the left-hand side of the graph we see a normal distribution. This is showing that a normal distribution is assumed in giving the age range of the sample. In other words, all of the runs made on a particular sample are expected to show normally distributed ages.

Let me summarize our discussion about the normal curve. Radiocarbon dates, such as those reported in Jull et. al. (1995) and others report the ages of their samples using the standard deviation (or "uncertainty"), which assumes the use of a normal distribution. They do this because while the sample has to be only one age, dating several pieces of a sample often gives slightly different ages because of experimental error; consequently the average gives a better estimate of the sample's true age. The normal distribution is used because all of the pieces or "runs" on the sample must date to the same age.

Now we return to Figure 3 and our sample set. Since the ages of the samples tested can be approximated by the normal distribution, it implies that all of the samples date to the same geological time. This suggests a single event when all of the given samples were isolated from the carbon cycle. Just as a normal distribution is assumed for the ages of the pieces of samples tested in modern radiocarbon labs, the normal distribution we see in Figure 3 implies that all of the samples under consideration—including many different sample types, dating to many different geologic time periods and analyzed in different laboratories—all date to a single event. This is consistent with the young-earth creationist expectation that all of these samples date to the time of the Flood.

A word of caution is in order when considering the results of this study: as

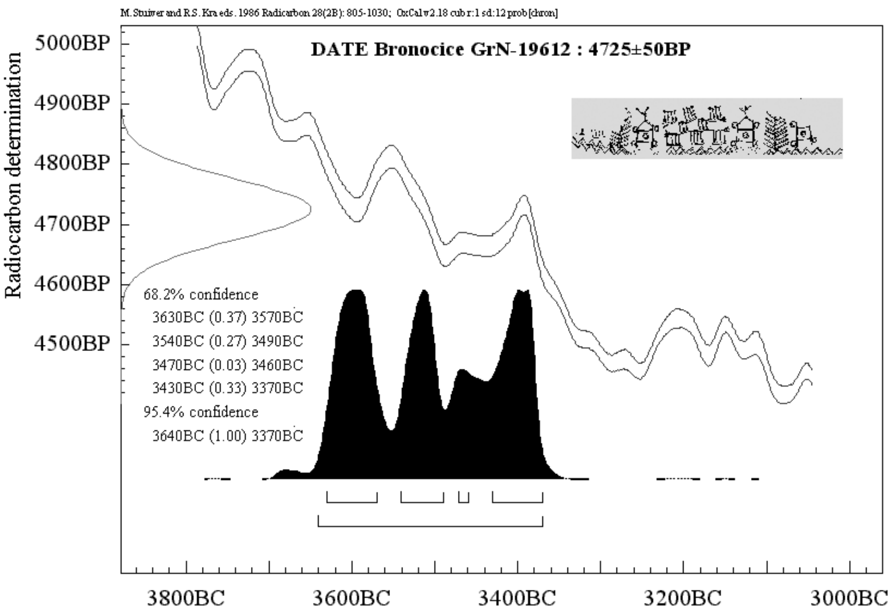

Figure 4. A calibration curve showing the "radiocarbon age" on the vertical axis and the calibrated "real age" on the horizontal axis. This graph shows the process of "wiggle-matching" in order to find the correct calibrated age. Notice the normal distribution on the right, indicating the age. This graph demonstrates that the possible age range of a given sample is normally distributed. Taken from http://www.comp-archaeology.org/SAA_Communication_Figs.htm (Anonymous, 1998).

noted above, no systematic analysis of radiocarbon in ancient geologic samples has been done to date, of which I am aware. My conclusion is reasonable but not exhaustive. It is my hope that this paper will stimulate more research into this subject as well as provide a basis for using the lognormal model in analyzing radioisotope data. This being said, the radiocarbon dating is still on the side of the creationist, and should be regarded a friend rather than a foe in the study of young-earth geology.

Summary and Conclusion

Many young-earth creationists believe that most of the carbon samples that were analyzed in this study were buried during or close to the time of the Flood. If this is in fact the case, we might expect that many of the samples would have approximately the same radiocarbon age. This radiocarbon age would not, of course, be the true age if the C-14/C-12 ratio before the Flood were different from what it is today. The actual age would not necessarily be accurate because we do not know what atmospheric conditions were like before the Flood, or whether the C-14 decay rate has changed. Based on our analysis of the sample ages, we conclude that the majority seems to follow a normal curve pattern, and we infer that this implies all of the samples date to approximately the same time. This conclusion is consistent with the young-earth position.

To clarify, this study does not rule out any trace of contamination in the samples tested, only that the pattern observed overall indicates that contamination is not responsible for all of the observed radiocarbon. More research is needed in this area to come to a definite conclusion regarding contamination. I suggest that an intensive research initiative could address the problem of contamination and intrinsic radiocarbon by testing across different sample types and ages, pre-test treatment regimens, and laboratories and then carefully analyzing the results. Unfortunately, this expensive solution will probably be necessary for the true nature of radiocarbon content and contamination in very old samples to be resolved in a satisfactory way for most people.

Radiocarbon studies have great potential in young-earth research to add to the body of evidence that favors the Biblical timescale and should be regarded as a friend rather than a foe. While one line of evidence will probably not convince secular scientists that the geological column is in error, radiocarbon dating is just one more demonstration that true science will always align with a proper understanding of God's Word. It is our task as creation scientists to find out how. It should also be remembered that study results and statistical reports always have a capacity for error, while the Bible is not subject to error when its message is understood correctly. As such, it is good to have a healthy skepticism of all scientific conclusions, while conclusions based on a sound exegesis of the Bible can be safely held without such apprehension.

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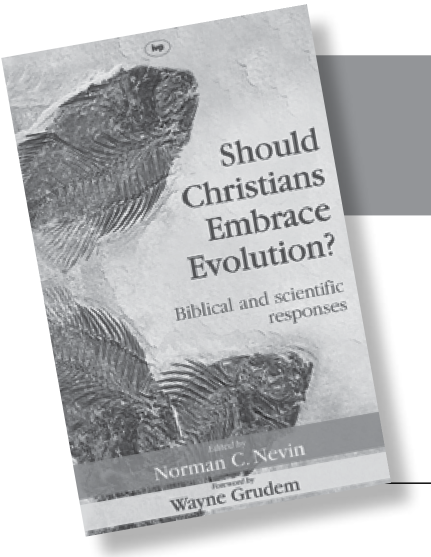
Appendix A: A Closer Look at the Lognormal Distribution

As we noted in the main body of the paper, the apparent radiocarbon levels found in geologically ancient carbon samples appear to be lognormally distributed. What does this actually mean? Of course, the most obvious point is that if the logarithm of every point is taken, a normal distribution will result (see Figure 2 for a comparison of the normal and lognormal distributions). Also, there are several important observations to make. For example, consider the histogram shown in Figure 1. First, note that there are no samples with a "zero" reading; the column above "0.0" on the graph shows those samples that are between 0.0 and 0.1 pMC. The minimum amount was 0.014 pMC. Second, most data points fall in a region close to but slightly greater than zero. Third, there are a few data points on the far right-hand side of the histogram, showing a few samples with unusually high C-14 levels. This is known as a "tail" in statistical lingo.

There are some important implications of using the lognormal model that future researchers, particularly those studying radiocarbon or other radioisotope dating methods, should keep in mind. The most important is that the standard parameters used to describe data, such as mean or average and standard deviation, cannot be used. This is because the equation that describes the lognormal curve contains a base *e* (other bases are certainly possible, but in dealing with radioisotopes the base will always be *e*).

Therefore, we must use parameters to describe lognormal data that are appropriate to the model. The geometric mean (designated by μ^*) and multiplicative standard deviation (σ^*) describes the shape of the distribution, rather than the typical additive mean or average (μ) and additive standard deviation (σ). These additive parameters are measures used to describe the *normal* distribution curve and should not be used to describe lognormal curves. Now, we can always take the natural logarithm of the data, produce a normal curve, and then apply our standard measures. This is certainly a valid option for researchers. However, we must be careful not to apply measures such as the additive mean to data that should be characterized as lognormal.

Because of the multiplicative nature of the lognormal parameters, we describe the spread of the data using the notation $\mu^* \cdot/ \sigma^*$ (geometric mean multiplied or divided by multiplicative standard deviation) to describe the shape of the curve, in contrast to the normal distributions, where we use $\mu \pm \sigma$. For a more thorough discussion of these parameters and how they are used to describe lognormal data, as well as contexts where the lognormal distribution is found in nature, see Limpert et. al. (2001).


Should Christians Embrace Evolution?
Biblical and scientific responses
Edited by
Norman C. Nevin
Foreword by
Wayne Grudem

Book Review

Should Christians Embrace Evolution?

Edited by Norman Nevin

InterVarsity Press, Downers
Grove, IL, 2009, 220 pages,
$17.00.

This book addresses the creation, evolution, and theology conflict in 220 pages. The authors include university professors and reputable scholars. Although this work focuses on the British situation and controversy, the conflict in the rest of the Western world is similar. The controversy over Darwinism and scientism long ago moved beyond America to Great Britain and the rest of the world.

This readable, well-documented collection of articles is edited by Norman Nevin, professor of medical genetics at Queen's University. The contributors include research scientist Geoff Barnard (Cambridge University), Andy McIntosh (Leeds University), Steve Fuller (Warwick University), John Walton (research professor in chemistry at St. Andrews University), Alistair Donald (environmental science), Michael Reeves (systematic theology), Alistair McKitterick (Moorlands College), Greg Haslam (Westminster Chapel), and R. T. Kendall.

The authors include Protestants, Catholics, and an agnostic. The book covers theology and science to document that Darwinism negates both the core and the basic doctrines of Christianity. Although written to respond to British scientist Denis Alexander's book *Creation or Evolution*, which advocates theistic evolution, the book does a superior job of responding to the common claim that no conflict exists between Christianity and Darwinism. Many people today claim that one can believe in both orthodox Christianity and evolution with no problem. As the authors of this book show, however, a lethal conflict exists between these two polar worldviews. The book documents that the conflict is at the fundamental level of Christianity and that evolution is not supported by the scientific evidence. Unfortunately, many churches have sided with Darwinism against science and the Scriptures, repeating the mistake that scientists and the church made with Galileo. Then, as now, all too often the church authorities side with orthodox science because they trust the scientific authorities. In Galileo's day, orthodox science endorsed Ptolemaic astronomy, which taught the earth was at the center of the solar system and the sun circled it. When Galileo presented evidence against establishment science, the church sided with the then-orthodox science view and opposed Galileo. Many churches make the same mistake today by siding with Darwinism.

A critical point here is that there is no point in trying to harmonize Christianity, Judaism, or Islam with Darwinism until Darwinism has been documented by empirical science. As the book shows, this has not been done; in fact, the opposite is the case. Since the preponderance of evidence is against Darwinism, as this work documents, to side with Darwinism at this time is premature if not irresponsible.

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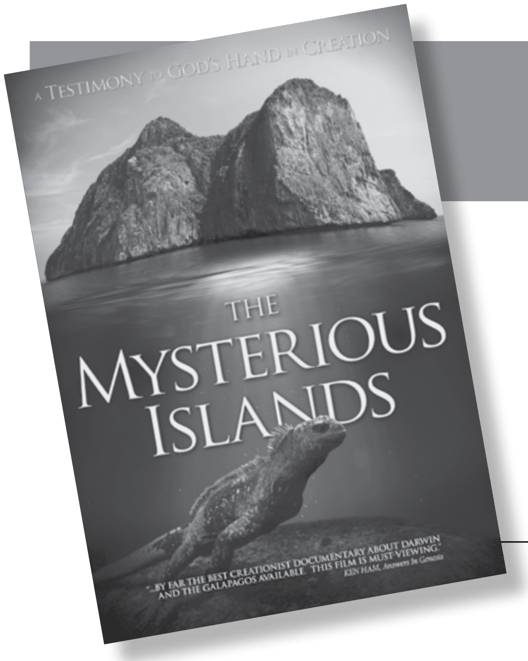
A Testimony to God's Hand in Creation
The Mysterious Islands
"...By far the best creationist documentary about Darwin and the Galapagos available. This film is must-viewing." Ken Ham, Answers In Genesis

DVD Review

The Mysterious Islands: A Surprising Journey to Darwin's Eden

DVD produced by Vision Forum and the Erwin Brothers, 2009, 100 minutes, $25.00.

This film follows the journey of a group of explorers to the Galapagos Islands during the two hundredth anniversary year of Charles Darwin's birth. This archipelago off the coast of South America is known to many as a laboratory for evolution. However, the team led by Doug Phillips of Vision Forum discovers that instead it is a showcase for creation and reveals the work of the Creator's hand.

The film highlights many of the unusual creatures that inhabit the islands, including the salt-spitting iguana lizard, the giant tortoise, the blue-footed booby, and of course the many kinds of finches. Topics covered in the film range from the wildlife and geology of the Galapagos to DNA, radioisotope dating, and the ideas and worldview of Darwin. Dr. John Morris of ICR is also featured prominently, and the film includes an amazing story of his trip to Mount Ararat in search of Noah's Ark, including an encounter with lightning.

Throughout the production, viewers are encouraged to wear Biblical glasses to properly interpret what we find in nature, including the unusual animals, plants, and geology of the Galapagos. By beginning with the right foundation, we are able to see the handiwork of the Creator throughout all of nature, and especially on these amazing islands.

Though a bit long, the footage and photography of the islands and their flora and fauna is spectacular and well worth the watch. Overall, the film is professionally done and deserves a place in every creation lover's library.

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Earth's Magnetic Field Is Decaying Steadily—with a Little Rhythm

D. Russell Humphreys*

Abstract

A new curve fit to a new compilation of data shows with new clarity that from 1900 to 2010, the main "dipole" part of the earth's magnetic field decayed exponentially (constant percent loss per year) with a small sine-wave variation. The time constant of the exponential part is 1611 (± 10) years. The sinusoidal part has a period of 66.1 (± 1.3) years and an amplitude of 0.29 (± 0.02) % of the main part today. The fit is very good, with most points within 0.05% of the curve. The distinctness of the exponential part gives new strength to the creationary model of the field, that losses in the earth's core today are steadily decreasing the electric current producing the dipole field, thus supporting a young earth. A simple electric circuit clarifies the decay model. The small sine-wave part, apparently not noticed in the dipole moment data before now, may be due to an east-west torsional oscillation between core and mantle. This corresponds to an approximately 60-year cycle observed in the rate of earth's rotation.

Introduction

Early in the nineteenth century, the German mathematician Karl Friedrich Gauss (1833, 1839) used many measurements from all over the world to characterize the earth's magnetic field. Using what is now called "spherical harmonic analysis," he mathematically divided the field into *dipole* and *non-dipole* parts. The dipole part, the main part, is the familiar two-pole (north and south) field shown in Figure 1. The earth's field deviates from that shape by a few percent in many locations. These deviations are due to the non-dipole part of the field, which I discussed in an earlier paper (Humphreys, 2001). This paper will concentrate on the dipole. The strength of its source is called the magnetic *dipole moment*. That number is (roughly) the electric current that causes the field multiplied by the area

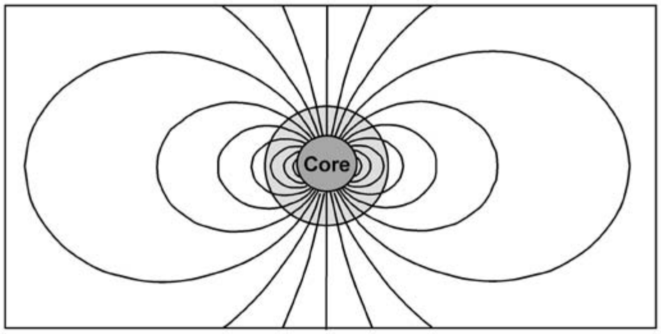

Figure 1. Dipole part of earth's magnetic field. The magnetic lines of force originate in the earth's electrically conductive core (fluid outer part, solid inner part), penetrate the earth's mantle of solid rock above the core, and extend far out into space.

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of the circle in which the current moves, so the dipole moment has units of Ampere square-meters (A m^2).

Following Gauss, scientists continued to make global measurements of the field. Four decades ago, Keith McDonald and Robert Gunst (1967, 1968) compiled the results of such measurements from 1835 to 1965. They drew a startling conclusion: during those 130 years, the earth's magnetic dipole moment had steadily decreased by over 8 percent! Such a fast change is astonishing for something as big as a planetary magnetic field. Nevertheless, the rapid decline remained relatively unknown to the public, a "trade secret" known mainly to researchers and students of geomagnetism.

A few years later, Thomas Barnes (1971), a creation physicist, began publicizing the trade secret. He showed how the decay of the dipole moment is consistent with simple electromagnetic theory (Barnes, 1973). A six-billion ampere electric current circulating in the earth's core would produce the field. By natural processes, the current would settle into a particular doughnut-shaped distribution, producing a dipolar field. The electrical resistance of the core would steadily diminish the current, thus diminishing the field. Dr. Barnes's fit to the dipole decay data he had then gave a half-life of 1365 years (time constant τ of 1970 years; see Appendix B). Using that value in his equations gave a value of core conductivity (inverse of resistivity) of 40,400 Siemens (inverse Ohms) per meter. That is consistent with laboratory-derived estimates (Stacey, 1969). The decay rate is so fast that if extrapolated smoothly more than a dozen or so millennia into the past, the earth's magnetic field then would have been unreasonably strong. These points taken together make a good case for the youth of the field and consequently for a young earth. Since then, I have been adding to Barnes's work, closing loopholes in it (such as explaining reversals of direction during the Genesis Flood) and extending it to other planets (Humphreys, 1983, 1984, 1986, 1988, 1990, 2001, 2008).

After Dr. Barnes fitted the dipole moment decay to MacDonald and Gunst's compilation of data, I added newer data from the geomagnetic literature and made a somewhat more extensive fit, shown in Figure 2 (Humphreys, 1983). However, even more recent and systematic data are now available, so in this paper I present a new curve fit to the new data.

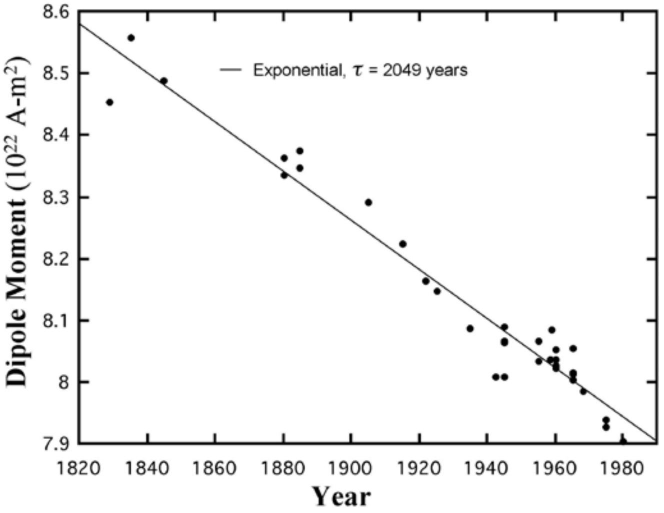

Figure 2. Previous compilation and fit (Humphreys, 1983) of 34 analyses of earth's magnetic dipole moment from 1829 to 1980. Large scatter mainly due to different methods of analysis. Time constant was 2049 (± 79) years (half-life of 1420 years).

What Form Should We Expect the Decay to Follow?

Clarifying nineteenth-century calculations by Horace Lamb (1883), Barnes (1973) re-derived the solution of Maxwell's equations of electricity and magnetism that is relevant to the decay of electric current in the earth's core. According to his solution, a few thousand years after any disturbance (Humphreys, 1986), the total electric current I circulating in the core should settle into a steady *exponential* (see Appendix B) decay:

$$I(t) = I_0 e^{-t/\tau}, \text{ where } \tau = \frac{\mu_0 \sigma R_c^{\,2}}{\pi^2}, \qquad (1a,b)$$

The magnetic permeability μ_0 is 4π × 10^{-7} Henry per meter, where σ is the electrical conductivity in Siemens (ohm^{-1}) per meter, R_c is the radius of the earth's core in meters, t is the time in seconds elapsed from a reference time defined as zero, I_0 is the current in Amperes at time zero, and τ is the *time constant* (see Appendix B) of the decay, in seconds.

Barnes showed that the electric current would have a particular distribution (Figure 3) throughout the core. Each oval contour in the cross-section marks off a ten-percentile of current density (Amperes per square meter). For example, the smallest oval contains all the current densities higher than 90% of the peak value, which is in the brightest region at the center of the oval. Extending the ovals westward around the axis in the direction of the arrow (the direction of the current) would form a set of nested toroids that carry the electric current.

This ideal distribution of current would make a magnetic field with the perfect dipole shape shown in Figure 1. The magnetic field **B** at any given point on the earth, and the magnetic dipole moment M, would be directly proportional to the

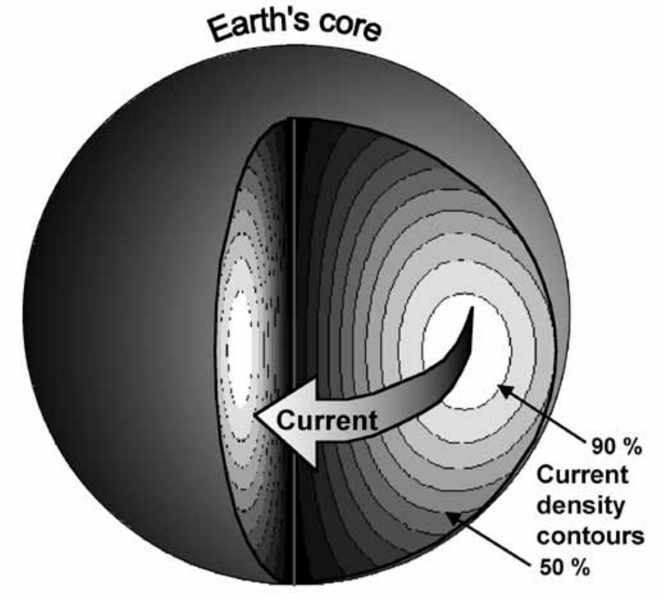

Figure 3. Electric current in the earth's core as calculated from Barnes's 1973 solution.

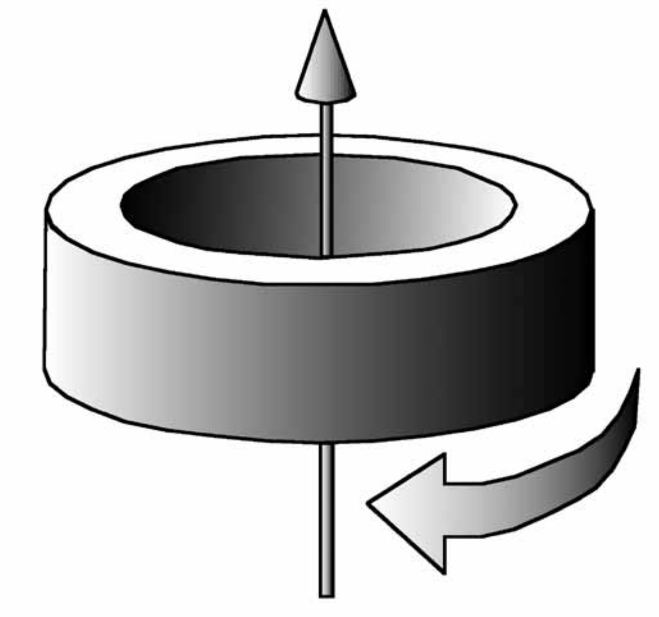

Figure 4. Slowing flywheel is analogous to decay of electric current in core.

exponentially decaying current of eq. (1). So the field and dipole moment also would decay exponentially with the same half-life.

It helps to compare this decay to the slowing down of a spinning flywheel due to fluid friction, as in Figure 4. The angular speed of the moving wheel represents the electric current, its angular kinetic energy represents the electromagnetic energy contained in the magnetic field, and the frictional drag represents the effect of electrical resistance. The angular kinetic energy has to be used up by the frictional drag to slow the wheel down. Frictional drag forces, being proportional to speed, slow the wheel down by a fixed percentage per unit time. That means the speed of the flywheel decays exponentially (Appendix B).

The Electric Circuit in the Earth's Core

To a physicist, Barnes's derivation is elegant and physically very sensible. This may not be fully appreciated by those lacking adequate physics training. But for those with electronic experience, I can offer a simple electric circuit representation. Figure 5 shows a loop (a torus) of thick wire with dimensions *a* and *b* carrying an electric current. Engineering handbooks (Knoepfel, 1970; see p. 315, eq. (A1.8), with $\ell \rightarrow 2\pi b$ and $d \rightarrow 2a$.) show that when *a* is significantly smaller than *b*, the inductance *L* of the loop is approximately:

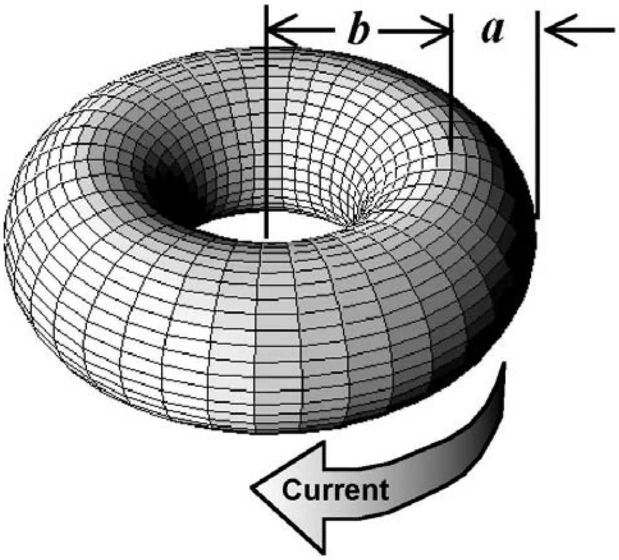

Figure 5. Thick loop of wire with circulating electric current. The cross-sectional radius a is a large fraction of the loop radius *b* to simulate the current distribution in Figure 3.

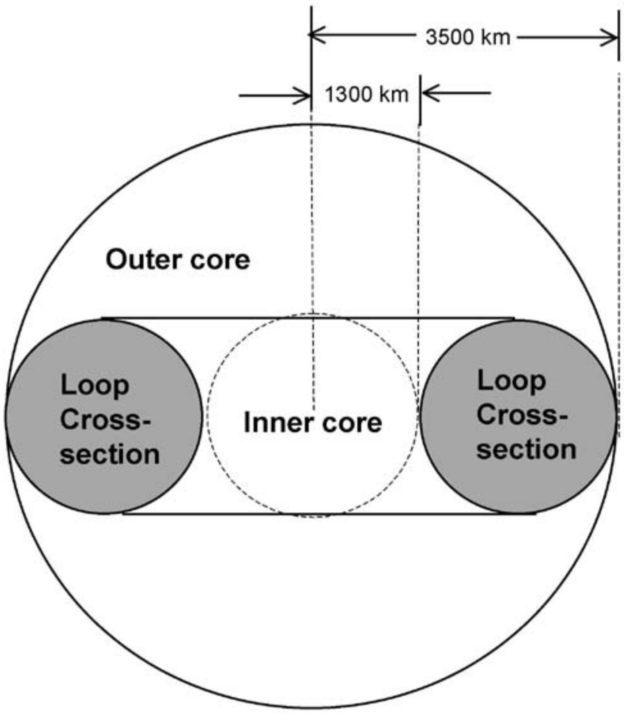

Figure 6. Current loop fitted into the earth's core. Arbitrarily choosing the loop dimensions to make it fit snugly between the inner core and the outer core radii gives it the dimensions shown. Compare to the 50% current density contour in Figure 3.

$$L \cong 2\mu_0 b\left[\ln\left(4\pi\frac{b}{a}\right) - 2.45\right] \tag{2}$$

Figure 6 shows the loop fitted snugly (and arbitrarily) between the solid inner core, radius 1300 km, and the outer edge of the fluid outer core, radius 3500 km. Having dimensions a = 1100 km and b = 2400 km, the loop has a cross-section similar to the 50% current density contour in Figure 3. Using those values (converted to meters) for a and b in eq. (2) gives us an inductance of roughly

$$L \approx 5 \text{ Henry} \tag{3}$$

The electrical resistance R of the loop would be approximately the product of the resistivity (inverse of the conductivity σ) of the material and the circumference of the loop, divided by the cross-sectional area of the loop:

$$R \cong \frac{1}{\sigma}\frac{2\pi b}{\pi a^2} = \frac{2b}{\sigma a^2} \tag{4}$$

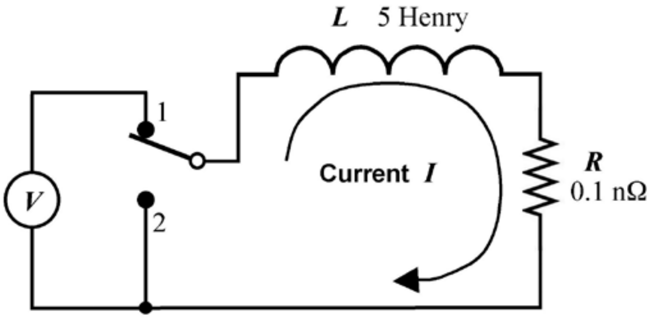

Figure 7. Equivalent circuit for electric current in core.

Geophysicist Frank Stacey (1969) estimated the conductivity of the core based on experimental material properties extrapolated to core temperatures and pressures, getting a σ on the order of 33,000 Siemens per meter. This value has a more realistic foundation than the larger values preferred by "dynamo" theorists (Merrill and McElhinny, 1983). Using that value and the values of a and b above in eq. (4) gives us an estimate of the electrical resistance of the current loop:

$$R \approx 10^{-10} \text{ Ohm} \tag{5}$$

This resistance is very small because the cross-sectional area of the loop is very large.

Figure 7 shows the equivalent electric circuit using the values of inductance and resistance from eqs. (3) and (5). Imagine that the switch is in position 1 and that the voltage V builds up the electric current in the circuit to the initial value I_0. That represents the creation model I suggested (Humphreys, 1983). Now flip the switch to position 2. Textbooks (e.g., Bitter, 1956; see p. 249, eqs. 6.50, 6.55) show that the current in the circuit will decay exponentially as in equation (1a) with a time constant τ given by:

$$\tau = \frac{L}{R} \tag{6}$$

Using the rounded-off values in eqs. (3) and (5) for L and R in eq. (6) (and converting seconds to years) gives a time constant of roughly 1600 years. Using the unrounded values gives a time constant of about 1400 years. These circuit-based estimates are on the same order of magnitude as the observed decay time. That means the observed decay rate is consistent with the inductance and resistance to be expected from the dimensions and materials of the earth's core.

I could have used more exact formulas for the inductance and resistance of the simplified loop of current, but my goal here was simply to show that a circuit approximation gives roughly the observed decay rate. For the exact time constant, do not use a circuit approximation at all. Simply use Barnes's exact result, eq. (1b) of this paper.

The current going through the resistance R dissipates the energy stored in the inductance L (i.e., in the magnetic field). This "ohmic" power loss is simply the product of the resistance and the square of the total current.

Accounting for Fluid Motion

The science of magnetohydrodynamics (Jackson, 1975, pp. 469–502) says that motions of the conducting fluid in the core should slowly twist the dipole magnetic lines of force into more complex shapes, subtracting from the dipole field and adding to the non-dipole field. Resistive losses then make the non-dipole field decay more rapidly (Humphreys 1986), so eventually the latter type of losses should prevail (Humphreys, 2001). We can combine the two types of loss by regarding R in the circuit as an *effective* resistance, including both the purely resistive loss and also the fluid-motion loss.

Flipping the switch in the circuit back to position 1 and making the applied voltage V vary appropriately with time, we can simulate other effects of fluid motion, such as the electromotive force due to the velocity of the fluid perpendicular to the magnetic field. Fluid motions in the core today appear to be very slow (Merrill and McElhinny, 1983, p. 44), so the voltage should be relatively small.

Summarizing the last three sections, we should expect the dipole field to be decaying exponentially, with only a small variation due to fluid motions. The data in the next section and the curve fit I describe (in the section following that one) show those two features distinctly.

A Better Compilation of Magnetic Data

McDonald and Gunst (1967, 1968), followed by Barnes (1971, 1973), and then myself (Humphreys, 1990, 2001, 2008), used the results of several analyses from different years to get graphs of the magnetic dipole decay. Each analyst used different methods, adding a degree of "analytical scatter" to the dipole moments from various years, as comparing simultaneous points in Figure 2 will show. But in 1968 the International Association of Geomagnetism and Aeronomy (IAGA) began more systematically measuring, gathering, and analyzing geomagnetic data from all over the world. This group of geomagnetic professionals introduced a "standard spherical harmonic representation" of the field called the International Geomagnetic Reference Field, or IGRF. Every five years, starting in 1970, they have published both dipole and non-dipole components of the field.

Using older data, the IAGA also extended the model back to the beginning of the twentieth century. With the issuance of the latest data set, IGRF-11, we have a standardized set of geomagnetic data from 1900 to 2010. You can download it free of charge as an ASCII file, a table of over 2700 numbers, from the National Geophysical Data Center website (International Association of Geomagnetism and Aeronomy, 2010). One of the IAGA authors estimates accuracies that I have used here (Lowes, 2010). The IGRF is the most consistent set of global geomagnetic data that cover such a long period of time.

The IGRF tables give the "Gauss coefficients" g_n^m and h_n^m from which we can construct the total field. For the dipole part, $n = 1$. It has three components, g_1^0, g_1^1, and h_1^1, corresponding to the z-direction (north along rotation axis), x-direction (center through equator at 0° longitude), and y-direction (center through equator at 90° longitude), respectively. We can calculate the dipole magnetic moment M from those three coefficients as follows (Merrill and McElhinny, 1983, p. 29):

$$M = \frac{4\pi R_e^3}{\mu_0}\sqrt{\left(g_1^0\right)^2 + \left(g_1^1\right)^2 + \left(h_1^1\right)^2} \quad , \qquad (7)$$

where R_e is the average radius of the earth's surface (6371 km) in meters. Converting the three Gauss coefficients from nanotesla to Tesla (1 T = 10^4 Gauss) then gives M in Ampere meters^2. Table I shows the Gauss coefficients for the dipole part, and the corresponding dipole moment, every five years from 1900 to 2010.

Fitting a Curve to the Data

Figure 8 is a log-linear graph (see Appendix B) showing the dipole moments of the new compilation of data in Table I. When these were initially plotted, I determined that I could draw a straight line (corresponding to an exponential decay; see Appendix B) right between the points as shown, dividing the data symmetrically between points above the line and points below it. Unexpectedly, the deviations from the straight line followed a smooth small "S"-shaped curve, contrasting greatly with the random deviations in my 1983 fit (Figure 2). Consequently, I attempted to fit the data with an exponential plus a small sinusoid:

$$M(t) = M_0\, e^{-t/\tau} + M_1 \sin\left(2\pi \frac{t - t_0}{T}\right) \quad , \qquad (8)$$

where t is the year AD and the constants the software adjusted to fit the data are:

M_0 = Amplitude of the exponential part in the year "zero" (really 1 BC) in A m^2.

Table I Magnetic dipole moments from the International Geomagnetic Reference Field (IGRF-11) for the years 1900 through 2010 (IAEA, 2010). The *g*'s and *h* are the Gauss coefficients for the dipole part of the field, in nanoteslas (1 nT = 10^{-5} Gauss). Magnetic dipole moment *M* is calculated from eq. (7) and is in units of 10^{22} A m^2.

No.	Year	g_1^0	g_1^1	h_1^0	M
1	1900	-31543	-2298	5922	8.32146
2	1905	-31464	-2298	5909	8.30081
3	1910	-31354	-2297	5898	8.27238
4	1915	-31212	-2306	5875	8.23545
5	1920	-31060	-2317	5845	8.19570
6	1925	-30926	-2318	5817	8.16042
7	1930	-30805	-2316	5808	8.12928
8	1935	-30715	-2306	5812	8.10647
9	1940	-30654	-2292	5821	8.09118
10	1945	-30594	-2285	5810	8.07531
11	1950	-30554	-2250	5815	8.06476
12	1955	-30500	-2215	5820	8.05067
13	1960	-30421	-2169	5791	8.02841
14	1965	-30334	-2119	5776	8.00474
15	1970	-30220	-2068	5737	7.97307
16	1975	-30100	-2013	5675	7.93873
17	1980	-29992	-1956	5604	7.90700
18	1985	-29873	-1905	5500	7.87107
19	1990	-29775	-1848	5406	7.84091
20	1995	-29692	-1784	5306	7.81425
21	2000	-29619.4	-1728.2	5186.1	7.78956
22	2005	-29554.6	-1669.1	5078.0	7.76745
23	2010	-29496.5	-1585.9	4945.1	7.74574

τ = Decay time constant of the exponential part, in years.
M_1 = Amplitude of sinusoid, in A m^2.
t_0 = Last year in the nineteenth century the sinusoid was zero
T = Period of the sinusoid, in years.

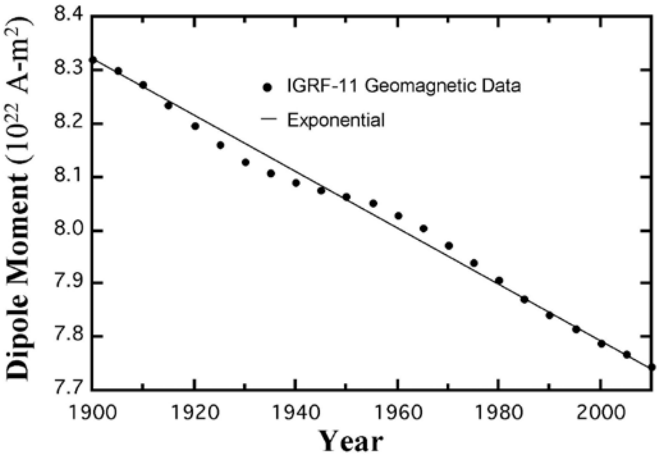

Figure 8. IGRF-11 dipole moments with exponential line only.

The software I used was a general curve-fitting routine in a data-analysis and graphics application for the Macintosh called *KaleidaGraph* 3.0 (See Appendix A). It fits any user-supplied equation to a user-supplied set of data. After I gave the software eq. (8), rough starting values for the five coefficients, and equal weight to all 23 data points, it quickly converged on the values in Table II and the curve shown in Figure 9. According to the reference guide, the software's value for χ^2 is the sum of the squares of the deviations of the fitted curve from the data points (Abelbeck Software, 1994). This gives a root-mean-square deviation of less than 0.05%. The regression coefficient *r* (not r^2), 0.99976, is very close to one. These numbers indicate a remarkably good fit between the exponential-plus-sine curve and the data, with very little scatter in the data (compared to Figure 2).

Using a linear fit with a sinusoid (instead of an exponential with a sinusoid) gives a slightly better regression coefficient, 0.99981. However, the difference of 0.00005 is probably not statistically significant. Rather, it merely suggests that 110 years of decay is too short a period for us to see a real difference.

Finally, Figure 10 shows the sinusoid that remains after we subtract out the exponential part of the fit. At this scale you can see the deviations of data from the curve, usually less than 0.05% of the total dipole moment. This scatter is consistent with one IGRF author's estimates of their r. m. s. error (Lowes, 2010), about 100 nT up to 1940, and smaller after 1960. Lowes (2010) implies that the error in a dipole coefficient is about a tenth of that, giving us roughly 10 nT error out of about 30,000 nT for the largest dipole component, g_1^0, or about 0.03%. So the curve fit appears to be about as close as the IGRF data will allow.

Table II. Results of fit to eq. (8). χ^2, or chi-squared, in this case is the sum of the squares of differences between the fit and the data; r is the correlation coefficient.

Parameter	Value	Error
M_0 (10^{22} A m^2)	27.027	0.197
τ (years)	1610.9	9.6
M_1 (10^{22} A m^2)	0.022792	0.00132
T (years)	66.118	1.25
t_0 (years)	1881.4	1.61
χ^2 (10^{22} A m^2)^2	0.00032	—
r	0.99976	—

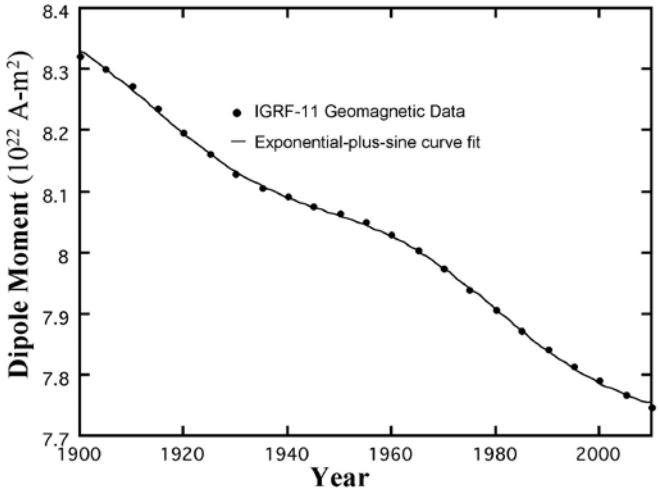

Figure 9. IGRF-11 dipole moments fitted to an exponential decay plus a sinusoid.

Possible Cause of the Sinusoid

Since the nineteenth century, geoscientists have noted a periodicity of about 60 years in the length of earth's day (i.e., in the rotation rate of the mantle), the peak differences being several milliseconds per day (Gross, 2001). They did not find a clear connection to that in the geomagnetic data. But a recent report, confirming a 62 ± 3-year period in the length of day, found a rough correlation with the inclination and declination (but not with the total dipole moment) of the field (Roberts et al., 2007). Until this year, geomagnetic experts had thought that was due to magneto-hydrodynamic "torsional waves" of fluid in the core, but a new analysis appears to rule that out (Gillet et al., 2010).

The six-decade sinusoid may come from a magnetically mediated mechanical east-west oscillation between the mantle and the core. In Figure 1, picture the magnetic lines of force as rubber bands having tension (Shercliff, 1965). The high electrical conductivity of the core anchors the lines in the dense fluid, allowing little motion. But the lesser conductivity of the mantle allows the lines to bend and move through it a little, exerting force on the mantle as they do so. If the mantle rotates eastward slightly faster than the core, the tension in the lines of force will slow the mantle and then make it swing slightly westward with respect to the core. The moments of inertia of core and mantle regulate the speed of the swinging. Thus the lines of force can convey a torsional oscillation between the core and the mantle. This would affect the length of the day. The motion of the mantle east or west (with respect to the dipole field lines of force embedded in the core) affects the strength of the field reaching the surface, thus imposing a sinusoidal oscillation on the dipole moment. Rough calculations suggest this model is feasible. If it is correct, the oscillation may be the remnants of a disturbance in the earth's rotation in the past. If the "*Q*" (efficiency) of the oscillation (Barnes, 1965) is moderately good, the disturbance could have occurred thousands of years ago—perhaps even during the Genesis Flood.

Whatever the mechanism, the data suggest that some kind of oscillation is at work in the core-mantle-field system. The sinusoid part of the curve fit in this paper appears to be the first clear indication of a 66-year periodicity in the magnetic moment. It is surprising that no one has previously detected this.

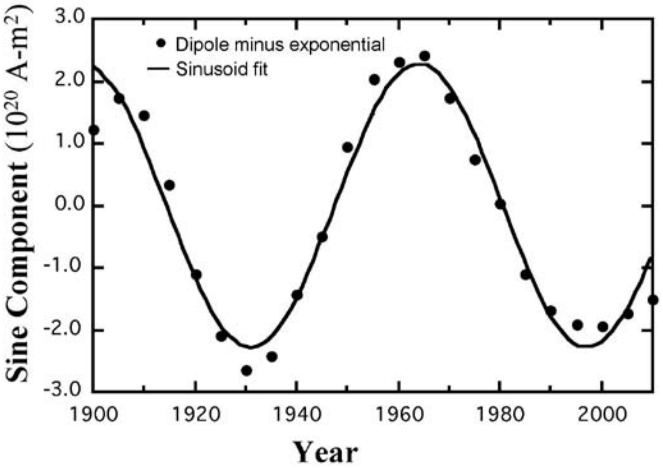

Figure 10. Sinusoidal residual after subtracting exponential from IGRF-11 data.

Discussion and Conclusion

A linear decay is very unlikely, requiring a precise time variation of voltage *V* in the circuit that is hard to generate, as electronic engineers trying to get linear waveforms will attest. That suggests the non-sinusoidal part of the curve is truly exponential. In turn, that implies the cause of the decay is energy dissipation, either directly by ohmic losses in the dipole-generating current, or indirectly by ohmic losses in parts of the current removed from the dipole part by fluid motion, as I mentioned earlier. In support of this, using the new time constant of 1611 (± 10) years in Barnes's exact eq. (1b)—not in the approximate circuit equations of eqs. (2) through (5)—gives a conductivity of 33,000 (± 200) Siemens per meter, falling right upon the value preferred by Stacey (1969). The sinusoid neither adds to nor subtracts from the long-term energy loss. These ideas weigh heavily against the idea that there is currently a "dynamo" process at work in the core that would ultimately restore the lost energy back to the field. Without such a restoration mechanism, the field can only have a limited lifetime, in the thousands of years. So the clarity of this new fit, especially the exponential part, is further evidence that the earth's magnetic field is young.

Acknowledgment: In the early 1990s, a former student of Dr. Barnes, working in California, telephoned me to discuss the decay of the earth's magnetic field. Unfortunately, I don't remember his name. But I recall he suggested there might be a small sinusoid in the decay. At that time we only had the data of Figure 2 to work with, and I was not convinced. Now that the data suggests he was right, I hope he will write a letter to this journal so he can claim the credit he deserves for the idea.

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Appendix A

1. See Barnes (1965) p. 239, eq. (11–45) for the relation of *Q* to losses in an electric circuit analogous to the torsional oscillation. The Biblically-suggested (note dates and times in Genesis 7 and 8) acceleration of the earth's rotation rate from 360 days per year to 365 days per year during the Genesis Flood (about 4350 years ago) would be a decrease of 20 minutes per day. That would probably produce a similarly large decades-long oscillation in the length of day. Assuming a 66-year period in the oscillation, an amplitude of 20 minutes then would diminish to the 4 milliseconds observed in the last few centuries if the *Q* of the oscillation were about 16. That would mean the amplitude of the oscillation would decrease by a factor of 1/*e* every 16 cycles.
2. See the *KaleidaGraph Reference Guide* (Abelbeck Software, 1994).Section 11.2.3, "General curve fits," pp. 227–232. On their usage of χ^2, see p. 232, eq. (12), which divides the square of each (i^{th}) deviation by a number σ_i, which they call the "weight." Because I gave each point equal weight, I assume that $\sigma_i = 1$.
3. In Humphreys (1986), Table 1 on p. 120 shows non-dipole decay times, much shorter than the dipole decay time.
4. In Humphreys (1983), depolarization of spins of hydrogen nuclei in the originally-created material, water, initiates the electric current, thereby preserving the created magnetic field due to the created spin orientation.
5. For published article on the previous (10th) generation of the IGRF, see (Mandea et al., 2000).
6. For Mandea et al. (2000), the authors are also listed elsewhere (*Pure and Applied Geophysics* 157:1797–1802) as: International Association of Geomagnetism and Aeronomy (IAGA), Division V, Working Group 8.
7. McDonald and Gunst (1968) provides a summary of their ESSA report of 1967.
8. Dynamo theorists assume a rather high core conductivity (usually 300,000 S/m), because that makes losses lower (e.g., Merrill and McElhinny, 1983, p. 213). In so doing, this eases the difficulty of imagining dynamo mechanisms that might make up for the losses.
9. The tension is B^2/μ_0, where *B* is the magnetic field intensity (Shercliff, 1965, p. 65).
10. Stacey (1969) gives a reference to his 1967 paper, where he uses a resistivity of approximately 3×10^6 emu. He comments that this is his preferred value, which is "10 times higher than the value usually assumed." Using Stacey's Appendix D, p. 277, his preferred value converts to 3×10^{-5} ohm-meter. Inverting that gives a conductivity of 33,000 Siemens per meter. Also on p. 150, Stacey derives circuit values for the core similar to mine, though he uses a somewhat different empirical formula for the inductance.

Appendix B: Handy Things to Know about Exponentials

e A symbol for the very important but irrational number 2.71828 ...

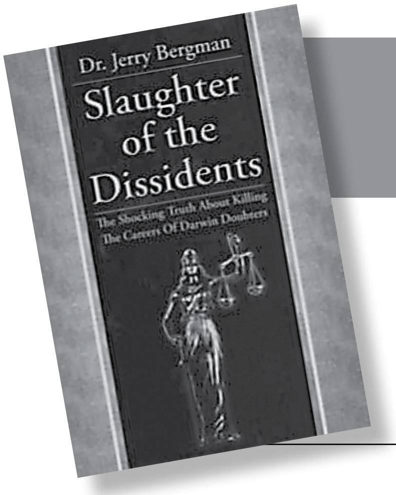
e^x *e* raised to the power of *x*, the exponential function of variable *x*, Exp(*x*).

Time constant Often written as the lowercase Greek letter tau, τ, as for decays (negative exponents) with time *t*, $e^{-t/\tau}$. After one period of time τ elapses, the quantity decreases to 1/*e* (36.8 %) of its value at the beginning of the period. If τ has units of years, dividing it into 100 gives the percentage decrease per year. All exponential decays have a constant percentage decrease per unit time.

Natural logarithm of x The (usually non-integer) power of *e* which gives *x*, or the logarithm to the base *e* of *x*, or $\log_e x$, or ln *x*.

Half-life The time needed for something to decay to half its starting value. Multiply the decay time constant τ by the natural logarithm of two (0.693) to get the half-life.

Log-linear graph Graph with logarithmic vertical scale (so that each factor of ten occupies the same vertical distance) versus (for example) time horizontally on an ordinary linear scale. The logarithmic vertical scale compresses a curved exponential decay line into a straight line. All graphs in this article are log-linear.



Book Review

Slaughter of the Dissidents

by Jerry Bergman

Leafcutter Press, 2008,
448 pages, $27 paperback,
$37 hardback.

The average Westerner is constantly reminded of the ideas put forth by people like evolutionary atheist Richard Dawkins: "One thing all real scientists agree upon is the fact of evolution itself. It is a fact that we are cousins of gorillas, kangaroos, starfish, and bacteria. Evolution is as much a fact as the heat of the sun" (Dawkins, 2005, p. 2).

Sadly, the average Westerner is becoming convinced: "Well, then, it's settled. All *real* scientists agree, after all. It must be so." The trouble is, they never seem to hear the other side of the story. They are not informed that there are literally thousands of scientists who have publicly proclaimed their doubts about Darwinian evolution. Nor do they realize that there are many thousands more who keep their doubts under their hats—for good reason, it turns out.

That reason is revealed in horrifying detail in Jerry Bergman's eye-opening book, *Slaughter of the Dissidents: The Shocking Truth about Killing the Careers of Darwin Doubters*. In it, Dr. Bergman describes the discrimination experienced by more than a dozen Darwin-doubting scientists, primarily in academia. And we are not talking insults at the water cooler. These men and women have been denied tenure and awards, forced out, fired, blackballed, even subjected to death threats—not because of what they did or said but because of what they believe.

Jerry Bergman experienced this sort of Orwellian discrimination himself in the late 1970s; he became disillusioned with Darwinism and lost his job at Bowling Green State University for saying so. Professor Dawkins would no doubt try to slap the "not a real scientist" label on him. But it would not stick, because Dr. Bergman has earned nine college degrees—two of them Ph.D.s—from the Medical College of Ohio, Wayne State University, The University of Toledo, and Bowling Green State University. He has spent more than 30 years teaching college-level biology, genetics, chemistry, biochemistry, anthropology, geology, and microbiology. He is currently adjunct associate professor and research associate at the Medical University of Ohio, and professor of biology and chemistry at Northwest State Community College. Dr. Bergman has 800 publications appearing in 12 languages, including 30 books and monographs, and has contributed to dozens of textbooks. He has presented over 100 scientific papers in the U.S., Canada, and Europe.

In fact, the "not a real scientist" label doesn't fit any of the Darwin doubters whose cases are presented in *Slaughter of the Dissidents*. Some of these scientists have already gained recognition through the amazing film *Expelled: No Intelligence Allowed*. Dr. Bergman picks up where Ben Stein left off, delving more deeply into the cases of Caroline Crocker and Guillermo Gonzalez. He also introduces his readers to many other highly qualified scientists who saw their careers derailed when their doubts about Darwinism came to the attention of their superiors.

So aside from their personal sacrifices, what's the harm? Dr. Bergman points out that so far, the majority of Americans side with the Darwin doubters. Surveys indicate that at least 44% believe God created **the earth and all the basic kinds of life**, another 38% fall somewhere along the continuum between creationism and theistic evolution, and only 9% are pure evolutionists.

But as the product of public education myself, including a journalism curriculum that taught, as far back as the 1970s, that what we cannot see is a figment of our imaginations, I worry about my own exhaustively educated generation and those of the future. Now that atheistic Darwinism is the only subject that can be safely taught in our schools and universities. Now that even a whiff of sympathy for intelligent design is punishable by immediate dismissal. And now that the God of the Bible has been booted clear out of public life, what will become of our Biblically ignorant citizenry not only in this life but, far more importantly, in the life to come?

Dr. Bergman provides suggestions for supporting the fight to restore academic freedom in this country, but it seems like an uphill battle. The politically correct evolutionary worldview is championed by groups like the ACLU and Americans United for Separation of Church and State; such groups are always standing by, ready to snuff out any suggestion of a Designer with lawsuits that few schools can afford to fight.

Darwinism is also part of the mainstream news media's dogma, as readers of most daily newspapers can attest, and as Dr. Bergman demonstrates again and again. Take, for example, the case of Rod LeVake, a Minnesota biology teacher who was removed from his high school biology class because he dared to criticize Darwinism. Incredibly, at least one national news magazine felt compelled to weigh in on his case. "*Time* portrayed creation-believing scientists as an almost non-existent minority," Bergman reports, "claiming 'reputable scientists who agree with LeVake can be counted on one hand' … *Time* went so far as to portray Mr. LeVake (in a full-page article) as a hillbilly" (p. 213).

No wonder creationists and intelligent design advocates are so often mocked by the highly educated, who greet any suggestion of an alternative to Darwinism with some version of "*Real* scientists believe in evolution!"

Now, thanks to Bergman's efforts, we can at last explain why that may seem to be the case: Darwinism appears to be the prevailing worldview because it is the only one that is allowed in our classrooms, on our campuses, on the pages of our mainstream newspapers and on the lips of mainstream broadcast reporters.

I finished *Slaughter of the Dissidents* more convinced than ever that it is time for those of us who care about academic freedom—and about proclaiming the truth of the Bible—to fight this unconscionable censorship. Read this outstanding book, and you will no doubt agree.

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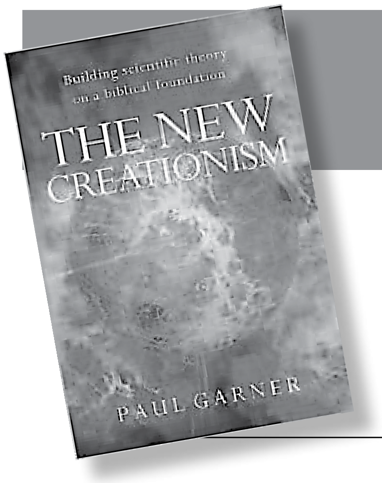

Book Review

The New Creationism

by Paul Garner

Evangelical Press, Faverdale North, England, 2009, 300 pages, $15.00.

British author Paul Garner holds an environmental sciences degree with emphases in geology and biology. He speaks and writes for the Biblical Creation Society (biblicalcreation.org.uk). This book includes a forward by Andrew Snelling, full references, and an index. Paul has a very clear writing style as he outlines the details of creation science. This includes brief summaries of the anthropic principle, baraminology, catastrophic plate tectonics, Genesis Flood details, the Ice Age, the RATE research project, and time dilation theory. When explaining evolutionary assumptions, Paul is gracious but uncompromising.

Isochrons are used by geologists to determine initial radioisotope products in rocks, and this description is made very clear (p. 95). In contrast, quantized redshifts are described as evidence for the Milky Way's location at the center of the universe without reservation (p. 29), even though such data is strongly challenged by astronomers. One of many crisp figures is the classic ichthyosaur fossil, which is interpreted as being overcome by flood sediment at the moment of giving birth (p. 205). One could mention the alternate explanation that the ichthyosaur baby was expelled spontaneously after the mother perished. With either interpretation, this famous "fish lizard" fossil formation was catastrophic.

This paperback book includes many positive comments from readers. It presents a clear case for Creation and will prove helpful to many readers worldwide.

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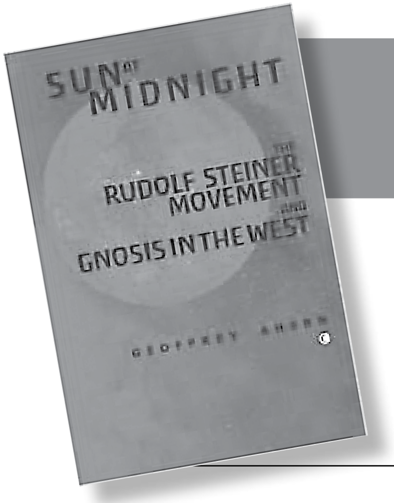

Book Review

Sun at Midnight: The Rudolf Steiner Movement and Gnosis in the West

by Geoffrey Ahern

James Clarke and Co., 2009,
277 pages, $42.50.

Geoffrey Ahern is a Fellow of the Centre for Leadership Studies at Exeter University, England. The book is a general overview of the Steiner movement from the perspective of a secular sociologist. Ahern examines Steiner's life, his cosmology, and the influences that led to his supposedly Christian version of Gnosticism. Ahern also looks at Steiner spin-offs such as biodynamic agriculture, Waldorf (Steiner) education, Camphill Homes, and "Christian Community" churches, showing how they are all based on Steiner's beliefs. In this review, the focus will be on Steiner's cosmology, which differs dramatically from that taught in the Bible.

Rudolf Steiner was born in Austria in 1861. He received a scholarship to study in Vienna, where he became involved in theosophy, a blend of Gnostic and Eastern religions. He eventually left theosophy to establish anthroposophy, based on his experiences with the spirit world. Steiner claimed his information came from the spirits of the dead (i.e., demons). Steiner died in 1925, but the institutions he established have grown and continue to ensnare people.

In Steiner's version of the creation of our universe, everything began as pure spirit. Under the influence of the demon Ahriman, this spirit began to harden into physical matter. Humanity appeared, evolving through a grotesque series of increasingly physical bodies developing on Saturn, the sun, and the moon. As humans evolved into our current form, we developed more specialized limbs and sense organs. Steiner avoids the problem of moving our developing bodies from one location to another by claiming the earth once included Saturn, the sun, and the moon, and each of those bodies was ejected from the earth as we evolved through stages.

We eventually acquired individual identities rather than a broad group ego that all early beings shared. Steiner claims that with the help of Lucifer and Jesus, we are beginning the reverse process back to fully spirit beings, though we will retain our individual egos. Steiner expands on this theory in his book *Cosmic Memory* (1908), which also examines the continuation of this process on Earth, where he says we evolved further, diverging into male and female forms. Steiner claims this bizarre prehistory does not originate with him but comes from the secret records. Of course, lacking is a single scrap of evidence supporting any of these allegations.

Steiner does not believe anything that the Bible says about the creation of our universe or the creation and destiny of mankind. He shows that if one rejects God's Word, there is no limit to the absurdities one can believe. Ahern concludes that Steiner believed salvation is through knowledge and good works, or as Steiner calls it, Esoteric Christianity.

Why does all this matter? Because on a faulty foundation, one cannot build a sound structure (Matthew 7:12-29). The following quote from one of Steiner's followers is almost frightening: "Through a study of Steiner's writings, one can come to a clear, reasonable, comprehensive understanding of human beings and their place in the universe" (http://www.steinerbooks.org/detail.html?id=9780893452278). Is there anything in Steiner's cosmology that is clear or reasonable? Substitute "the Bible" for "Steiner's writings," and you have a statement I agree with.

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Friedrich Nietzsche's Superman, a Child of Darwin

Jerry Bergman*

Abstract

The life and worldwide influence of German philosopher Friedrich Nietzsche was researched, stressing the effect of Darwinism on Nietzsche's worldview and, in turn, Nietzsche's impact on academic and world leaders such as Adolf Hitler. The reasons why Nietzsche saw Christianity as the antithesis of his philosophy were discussed in some detail. It was concluded that Nietzsche was a tragic figure, a disciple of Darwin, and a supporter of eugenics who, as a whole, had a very negative influence on society.

Introduction

Friedrich Nietzsche (1844–1900) is viewed by many academics as one of the greatest philosophers of the last century (Hausheer, 1962) and the most famous philosopher of the second half of the nineteenth century (Gayon, 1999, p. 154). Wright wrote that no

> philosopher since Kant has left so undeniable an imprint on modern thought as has Friedrich Nietzsche. Even Schopenhauer, whose influence colored the greater part of Europe, made no such widespread impression. Not only in ethics and literature do we find the molding hand of Nietzsche at work, invigorating and solidifying; but in pedagogics and in art, in politics and religion, the influence of his doctrines is to be encountered (1954, p. vii).

Professor Flew (1979, p. 292) added that Nietzsche was also "one of the greatest prose stylists of modern times." Stone (2002, p. 65) concluded that Nietzsche was so popular among intellectuals that his ideas actually served as a "social glue in 'progressive' intellectual circles."

Born in Röchem, Germany, in 1844, Nietzsche was the son of a Lutheran pastor (Flew, 1979). Educated at the Universities of Bonn and Leipzig, he was a brilliant student and was appointed a professor at the University of Basel in 1867 at the young age of 24. While still a student at the University of Bonn, Nietzsche turned against religion, spending the rest of his life actively campaigning against Christianity (Wright, 1954, p. vii). By 1889, he appeared to be developing mental problems leading to insanity, and took his own life in August of 1900 (Flew, 1979).

Nietzsche Converts to Darwinism

As a youth, Nietzsche was so devoutly religious that he was called "the little minister" and "a Jesus in the Temple" by his friends. After studying Darwin he became a staunch atheist and spent the rest of his life proselytizing for his version of Darwinism (Durant, 1926, pp. 437–438). He first discovered Darwin's ideas from reading Friedrich A Lange's *History of Materialism* in 1866 while still a student. Lange argued that theism was ignorant superstition and, in contrast:

> Darwin's *The Origin of Species*… was no piece of mythology. It did not deal in Articles of Faith, which have no lawful place in science, but offered a comprehensive explanation for the evolution of all living beings based

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> on observed similarities in different species. The struggle for animal existence had been going on for centuries and millennia, yet only in recent times had this basic fact begun to receive serious attention from the seekers of the truth (Cate, 2005, p. 74).

Shortly after he was introduced to Lange, Nietzsche accepted his philosophy, and abandoned God and Christianity for Darwinism. Lange also discussed in detail life's "struggle for a spot on earth…and extermination of other life," ideas that lead him to attempt to support eugenics (Cate, 2005, p. 74). Nietzsche was also a close friend of Rütimeyer, an important German paleontologist who was friends with Darwin and played an important role in introducing Darwinism into Germany (Gayon, 1999). Schopenhauer also had a "mighty impact on Friedrich Nietzsche," and Darwin, in turn, had a substantial influence on Schopenhauer's philosophy (Cate, 2005, p. 66).

Darwin's theory of evolution was enthusiastically welcomed in Germany by both the scientific and academic establishments. Darwin's main disciple and his major popularizer, both in Germany and much of the world, was German biologist Professor Ernst Heinrich Haeckel. Although Nietzsche may have never read Darwin's books in the original English, his writing documents the fact that he was very influenced by German biologists such as Haeckel—the "most influential Darwinian Biologist in Germany" (Weikart, 2006, p. 97).

Nietzsche was most famous for his writing about the "God is dead" theory, the conclusion that God was just another vestige of our unscientific past (Newberg et al., 2001, p. 128). Nietzsche concluded that modern science, primarily Darwinism, and the increasing secularization of European society, had effectively "killed" the Christian God, who had served as the basis for both meaning and value in Western society for over a thousand years. His Übermensch idea, literally "over man," usually translated as Superman, is the view that a superman is a "man above others…the higher type of humanity" and "the goal of evolution" (Hausheer, 1962, p. 307). The connection between Nietzsche's followers and eugenicists was so close that Stone concluded the difference is somewhat arbitrary (Stone, 2002, p. 65).

Nietzsche Hated Christianity

Koster wrote that Nietzsche not only popularized the phrase "God is dead," but condemned "every religious system—Christian, Jewish, Islamic, and Buddhist. He sneered at traditional Judeo-Christian morality as tame, cowardly, and hypocritical" (1989, p. 83). It was from Darwin that Nietzsche learned "the theory of evolution as the survival of the fittest" (Jessop, 1967, p. 233). In his *Der Antichrist*, Nietzsche released "unprecedented vehemence [and] attacks on Christian and utilitarian ethics" (Flew, 1979, p. 229). Cate recounts the development of Nietzsche's hatred of Christianity, noting when the young Nietzsche

> had first heard of Charles Darwin and his theories, he had instinctively scoffed at the idea that human beings might be descended from apes. But that was before he had read *The Origin of Species*, or had devoted any serious attention to this and other scientific subjects. Since then it had dawned on him that Darwin, with his theory of biological evolution stretched out over an enormous passage of time, had dealt to all forms of anthropomorphic religion a blow far more deadly than the one Copernicus had dealt to medieval Christianity (Cate, 2005, p. 354).

Nietzsche then took Darwinism to its logical conclusion—eugenics—and this was a major reason why he hated Christianity. Specifically, he believed that Christianity "imposed on Europe a servile morality—submission, gentleness and care for the weak and ungifted," which opposed evolution by natural selection (Jessop, 1967, p. 233). Nietzsche demanded an unconditional power of human will and, therefore, "there is no room for Christian…meekness and pity. He made this point clear enough, clearer than any other aspect of his teaching" (Lavrin, 1971, p. 85). Furthermore, Nietzsche

> preached will as the assertion of life, that is, bodily vigour and mental daring, without petty scruples. Those in whom will is strong and presses on to greatness of mind and deed are 'supermen' (Jessop, 1967, p. 233).

Nietzsche concluded that it is the superior humans, those he called the Supermen, who made history

> and it is for them that society exists. They alone are entitled to privilege, to dominance in every sphere, to freedom from subordination, morality as usually understood, and religion, which is false anyway and which they do not need. Other men exist for them, as tools. These, weak in will, try to get what they want by cringing or cunning, or by combination for collective strength, democracy being simply a device of the little to hold down the big, other devices being such religious and moral pretensions as that all men are equal and that we should be kind to one another—all which is contrary to the plain intention of the evolutionary process (Jessop, 1967, p. 233).

His attitude toward the common men and women was expressed in his blunt words:

> Man shall be trained for war, and woman for the recreation of the warrior: all else is folly. The happiness of man is *I will*. The happiness of woman is *He will*. Thou goest to woman? Do not forget thy whip! (Nietzsche, 1950, pp. 68–70, emphasis in original).

In short, he believed Christianity was a social system that enabled inferior humans to survive in the Darwinian struggle for existence (Stone, 2002). Lichtenberger concluded that Nietzsche (1910, pp. 138–139) viewed Christianity as the religion of pity

> that tends to protect the existence of degenerates…. The religion of pity carries with it the extreme, evil consequence of prolonging a number of useless lives which are really condemned by the law of selection. It preserves and increases the amount of misery in the world, and consequently makes the universe uglier…[is] a menace to existence and to the moral health of…humanity.

Hence, the appeal to Darwin's law of selection is brought into the service of a Nietzschean cause in Nietzsche's conclusion that Christianity is "the religion of pity" that has "contributed to the degradation of European races and hindered the production of higher men, the evolution of humanity towards the superman" (Lichtenberger, 1910, p. 139).

His Mental Breakdown

Much speculation exists about the relationship between Nietzsche's philosophy and his mental breakdown. One claim is that Nietzsche suffered from the effects of syphilis that caused gradual creeping paralysis and mental problems, producing a manic-depressive disorder (now called bipolar disorder), failing eyesight, and, toward the end of his life, precocious drooling senility. Although Wright (1954, p. x) claims that this diagnosis is in little doubt, Cate (2005, p. 72) concluded the syphilis claim is "a mystery that will probably never be elucidated."

Wright also claims that in January of 1889, an "apoplectic fit" marked the beginning of the end for Nietzsche. He then "exhibited numerous eccentricities, so grave as to mean but one thing: his mind was seriously affected" (Wright, 1954, p. x). Wright (1954, p. x) claims that the immediate

> cause of Nietzsche's breakdown was due to…his excessive use of chloral which he took for insomnia, the tremendous strain to which he put his intellect, his constant disappointments and privations, his mental solitude, his prolonged physical suffering. We know little of his last days before he went insane. Overbeck, in answer to a mad note, found him in Turin, broken.

Others believe that his ideas were a major factor, if not *the* major factor, that influenced his breakdown (Wiker, 2008). Mügge (1914) in a detailed review of his mental breakdown described his mental state in terms such as his "sorrow," (p. 85) that he "uttered in the fantastic tone of a madman" (p. 86), "sleep could only be obtained artificially" (p. 90), and when it "was ascertained that Nietzsche was insane," he was put in an institution (p. 85).

Nietzsche and Darwin

Nietzsche was enormously influenced by Darwin, so much so that he was called "the child of Darwin" (Durant, 1926, p.301). He was also, besides Spencer, the first major philosopher to stress the need to "dialogue with Darwin" (Gayon, 1999, p. 155). Nietzsche's "serious commentaries on Darwin and Darwinians began in *Human All-too-Human*… and developed uninterruptedly from then on" (Gayon, 1999, p. 154). His information on Darwinism came from two sources: popular books and a large network of eminent scientists and philosophers that he regularly interacted with (Gayon, 1999, p. 160). As a result, Nietzsche adopted a "Darwinistic…approach to the fundamental problems of philosophy" (Cate, 2005, p. 251).

Yet, the German Nietzsche did not always agree with the English Darwin and even ridiculed some of his ideas. Historian Will Durant explained this fact by concluding that Nietzsche seemed to denounce those who most influenced him, which was Nietzsche's "unconscious way of covering up his debts" to others (Durant, 1926, p. 435). One difference in their philosophies was Darwin's "survival of the fittest" idea became Nietzsche's "will to power," an idea that was one of the cornerstones of Nietzsche's philosophy (Lavrin, 1971, p. 27). Nonetheless, the many similarities between Darwin and Nietzsche

> are obvious: all rising above the merely animal is caused to struggle, war, and the brutal elimination of the less fit by the stronger. Nietzsche believed this to be the core natural truth of aristocracy—that the better should rule over, and hence should use, the lesser. "The essential characteristic of a good and healthy aristocracy" is that it "accepts with a good conscience the sacrifice of untold human beings who, *for its sake*, must be reduced and lowered to incomplete human beings, to slaves, to instruments." The "fundamental faith" of aristocracies then, is that "society" exists for them, for their sake, so that all the lesser types who serve them in society exist "only as the foundation and scaffolding on which a choice type of being is able to raise itself to its higher task and to a higher state of being." One cannot help but think of the Nazi's justification for enslaving the Slavs as "lower men" (Wiker, 2008, p. 107).

The Close Relationship Between Darwin and Nietzsche

Unfortunately, the close relationship between Darwin and Nietzsche "has been largely ignored because of the horrifying developments that…emerged in history between 'Social Darwinism' and 'Nietzscheism'" (Gayon, 1999, p. 156). Actually, Nietzsche often went beyond Darwin. Darwin tried to give an evolutionary account of "moral" qualities that helped to explain the evolution of traits, such as sympathy for the suffering of others and even the highest human moral development. Conversely, Nietzsche actually regarded

> such sympathy as destructive of evolution's forward march. That is, Nietzsche rightly sees that Darwin's praise of sympathy contradicts his own account of exactly what makes for evolutionary progress: "life itself is *essentially* appropriation, injury, overpowering of what is alien and weaker; suppression, hardness, imposition of one's own forms, incorporation and at least, at its mildest, exploitation." Since these are the very qualities that allow living things to flourish, asks Nietzsche, why are they considered evil? (Wiker, 2008, p. 107 emphasis in original).

Characteristics of the Superman

Nietzsche, in his *Thus Spake Zarathustra*, wrote that man is "not the apex of evolution, but a missing link to a higher species—an idea he clearly derived from Darwin" (Koster, 1989, p. 82). Nietzsche's "higher species" was a small elite of humanity who are men above others. Nietzsche (1950, p. 6) explained this superior human as follows:

> What is the ape to man? A laughingstock, a thing of shame. And just the same shall man be to the Superman: A laughingstock, a thing of shame. Ye have made your way from the worm to man, and much within you is still worm. Once ye were apes, and even yet man is still more of an ape than any of the apes… The Superman is the meaning of the earth. Let your will say: The Superman *shall* be the meaning of the earth!

Nietzsche believed that only these Supermen, creative geniuses like himself, would rise above the rest of humanity and only they had the right to be free. These Supermen were not necessarily physically strong as the common interpretation of a superman implies, but although they may be weak in one sense, they were "atypical and creative" in ways that allowed them to move humans forward socially, economically, and in other ways (Gayon, 1999, p. 163).

Nietzsche disdained the masses, which he thought incapable of exercising true freedom. What Nietzsche contemptuously called the "herd mentality" of the masses made them fit only for submission to be dominated by the Supermen. Nietzsche's superman is "self-contained and aloof…who evolves through ruthless competition and triumph of will" (Milner, 1990, p. 338). Nietzsche also "developed an increasing explicit justification for intentional selection in the human species (i.e., eugenics)" (Gayon, 1999, p. 165). It is this idea that had a major influence on Nazism.

Another important influence on Nietzsche was Lamarckianism. Nietzsche accepted Lamarckianism, as did Darwin, partly because Rütimeyer, Nietzsche's mentor, was a Lamarckian. In addition "throughout his life, Nietzsche preferred to read neo-Lamarckian authors, and he adapted their ideas" to his Superman theory, as is obvious in Nietzsche's key conclusions, such as the importance of the will from within (Gayon, 1999, p. 159). Nietzsche's Lamarckian ideas caused him to conclude that a person's internal "will" came from within him, and by this will one could make himself into a Superman—the "will to power," he called it.

The core of Nietzsche's philosophy was a blend of pagan Greek ideas, "eugenics and modified Darwinism," plus Lamarckianism (Lavrin, 1971, p. 27). Although Nietzsche deprecated aspects of Darwin, he enthusiastically accepted Darwinism's core tenets, such as the "survival of the fittest" principle, which Nietzsche translated into "dominance of the fittest," which "under the new label of the 'will to power" became "one of the cornerstones of his sociology" (Lavrin, 1971, p. 27). In contrast to Darwin, the "survival of the strong exceptional individual" was interpreted by Nietzsche to evolve as a result of a

> continuous effort for the maintenance and the increase of one's power in the struggle for the quality of existence. Hence Nietzsche was driven to regard the figure of the idealized warrior as being eminently suitable for the *élite* of which he dreamed. And since he waged a simultaneous war with himself, he naturally advocated hardness and Spartan ruthlessness for both battles (Lavrin, 1971, p. 27).

Despite his stress on freedom for the elite, Nietzsche's philosophy was, in fact, a very suppressive inhuman ideology that aimed at enslaving others. He taught that power ultimately decides not only who rules, but also what counts as truth. Nietzsche rejected any form of fixed truth or morality, thus undermining our very notion of human rights. He despised weakness, compassion, and humanitarianism, preferring strength and domination.

Nietzsche was especially vehement in his rejection of Christian ethics because it catered to the weak and downtrodden. His aristocratic morality aimed both at justifying and benefiting the strong and powerful. Comte-Sponville (1991, pp. 51–52; quoted in Gayon, 1999, p. 156) noted that one of his more nefarious ideas was to systematically side

> with force against law, with violence or cruelty against gentleness, with war against peace, who defended egoism, who placed instincts above reason…who claimed that there were neither moral nor immoral actions…who justified castes, eugenics and slavery, who openly celebrated barbarity, disdain for the mass[es], the oppression of the weak and the extermination of the sick [and] spoke of women and democracy in a way that was extremely unpleasant.

Nietzsche and Eugenics

Stone (2002, p. 65) concludes that there was a "profound interconnection" between Nietzsche and eugenics. Nietzsche's writings were used by eugenic advocates in both Europe and America. Mügge (writing in *Eugenics Review*, quoted in Stone, 2002, p. 62) writes:

> To Sir Francis Galton belongs the honour of founding the *Science* of Eugenics. To Friedrich Nietzsche belongs the honour of founding the *Religion* of Eugenics.... Both aim at a Superman, not a Napoleonic individual, but an ideal of a race of supermen, as superior to the present mankind—many of whom, alas! have not even completed the stage of transition from animal to man—as man is superior to the worm.

The goal of Nietzsche's view of eugenics was actually less to produce a perfect society than it was to justify class and race prejudices (Stone, 2002, p. 66). Some reviewers even interpreted Nietzsche's master and slave idea as creating two separate races, roughly dividing humans into superior and inferior races and "hybridity between the races…usually brings indubitable racial degeneracy" (Stone, 2002, p. 63). He taught that "the lower races of mankind [must] give way before the evolution of the superior races" can occur (Stone, 2002, p. 63). Mügge (1914, p. 6) wrote that Nietzsche was "an ally of Galton, his Superman is a poetic dream of the latter's Eugenetics." In fact, Nietzsche was more than an ally of Galton, much more. He went beyond Galton's passive eugenics and advocated a form of active eugenics that was both more aggressive and more coercive then Galton envisioned. Furthermore, in many ways Nietzsche was more influential then Galton, especially among the intellectuals and academics.

Nietzsche Influenced World Leaders

Nietzsche's "colossal influence in his homeland" also spread to leading intellectuals and government leaders (Cate, 2005, p. 569). In the twentieth century, many existentialist philosophers, including Heidegger and Sartre, embraced the general idea of Nietzsche's philosophy, denying that humans have any fixed essence and stressing that radical free will was a right only for the Supermen. Later in the twentieth century, however, many postmodern thinkers, although heavily influenced by Nietzsche, reduced the individual agency element, thereby spiraling dehumanization even further downward. The relativism that is the foundation of "postmodernism" was openly influenced by Nietzsche's teaching that there are no absolutes, no givens, no God, and all his values are a result of his anti-Christian philosophy (Staub, 1992, pp. 111–112).

Sarolea predicted in 1917 that the ideas of Nietzsche and other philosophers, what he calls the "war-triumvirate," would lead to a great war. One reason why is Sarolea concluded that Nietzsche was "the spiritual father and forerunner of the Eugenicists," adding that the "Superman is not born, he must be bred" (Sarolea, 1917, p. 92). History has, unfortunately, proved Sarolea correct.

Nietzsche influenced not only intellectuals and college professors, but also political leaders, notably Adolf Hitler (Gayon, 1999, p. 155). Professor Vitz wrote that Hitler was "deeply influenced by two atheist philosophers—Schopenhauer and Nietzsche" (Vitz, 1999, p. 106). Hitler's lifelong friend, August Kubizek (1954, p. 136), wrote that Nietzsche was one of Hitler's favorite writers. Furthermore, Hitler knew that he was using social Darwinism and Nietzscheism when he

> wrote that "the State has the obligation to favor the victory of the best and of the strongest, and to impose the submission of the evil and of the weak" he thought that he was using language that was both scientifically "Darwinian" and philosophically "Nietzschean" (Gayon, 1999, p. 156).

Wiker (2008, p. 152) added that Hitler's philosophy was an "amalgam of Machiavelli, Darwin, Schopenhauer, and Nietzsche." German historian Erwin Lutzer documented that Hitler was "mesmerized" by Nietzsche's philosophy. He even "considered himself the superman of Nietzsche's philosophy" and "rejoiced that the doctrine of God that always stood in the way of brutality and deceit had now been removed" (Lutzer, 1995, p. 28).

Hitler admired Nietzsche to the extent that he gave special favors to his family (Cate, 2005, p. 575). He visited Nietzsche's sister, a "vicious anti-Semite," posed for a photo besides Nietzsche's bust, and the inventory at the Reich Chancellery lists a first edition of Nietzsche's eight-volume collected works (Ryback, 2008, pp. 105–106). Staub (1992) concluded that the influence of Nietzsche was important in not only Hitler's worldview but on the Nazi movement in general. He noted the fact that many Nazi ideals and beliefs were very similar to those expressed by Nietzsche was no accident.

Even though Hitler was clearly influenced by Nietzsche and stated that he valued Nietzsche as a genius, it is unknown how much in-depth study of Nietzsche Hitler actually undertook (Ryback, 2008). We do know that Nietzsche's book *Thus Spake Zarathustra* "became a bible for the goose-stepping, straight-arm-saluting adolescents of the *Hitler-Jugend*," (Cate, 2005, p. 576) along with *Mein Kampf* and the racist anti-Semitic tome *Myth of the Twentieth Century*. Nietzsche also influenced the race hygiene movement of Professor Alfred Ploetz, author of *The Fitness of our Race*, the book that influenced many Nazi leaders and intellectuals (Padfield, 1990, pp. 32–33). Ploetz even opened his influential book with the following quote from Nietzsche: "Upward leads our way from the species to the superspecies" (Ploetz, 1990, p. 33).

There were, though, differences

between Nietzsche and Hitler's philosophy. Nietzsche stressed the elevation of superior individuals, not the elevation of a race. The cause of both superior individuals and races was the result of genetics and, for this reason, their differences were minor because a race is simply a large number of superior individuals classified together by genetic traits. Hitler used Nietzsche's ideas in order to persuade the German people of the idea that the Germans were the "Master Race."

The importance of Nietzsche's writings was argued by Viktor Frankl, a Jew who survived the horrors of Auschwitz. Frankl, an eminent neurologist and psychiatrist and the founder of the school of psychology called logotherapy, is considered one of the most important psychologists of the last century. Dr. Frankl astutely evaluated the influence of modern European philosophy, especially that of Nietzsche, in helping to prepare the way for the Nazi atrocities. Frankl (1986, p. xxxii) concluded that the

> gas chambers of Auschwitz were the ultimate consequence of the theory that man is nothing but the product of heredity and environment—or, as the Nazis liked to say, of 'Blood and Soil.' I am absolutely convinced that the gas chambers of Auschwitz, Treblinka, and Maidanek were ultimately prepared not in some Ministry or other in Berlin, but rather at the desks and in the lecture halls of nihilistic scientists and philosophers.

Nietzsche's influence was also felt in America. One reason why William J. Bryan opposed evolution and became involved in the Scopes trial was because "Nietzsche carried Darwinism to its logical conclusion and denied the existence of God, denounced Christianity as the doctrine of the degenerate, and democracy as the refuge of the weakling; he overthrew all standards of morality and eulogized war as necessary to man's development" (Bryan, 1924, p. 146).

Some Darwinists attempted to dissociate themselves from Nietzsche, not because they disagreed with his philosophy, but because they thought him too extreme. Conversely, many persons, especially those in the eugenics movement, celebrated his work (Stone, 2002, p. 64). Nietzsche is still a major philosopher today, celebrated and emulated for his wisdom and insight into human nature and morality (Leiter, and Sinhabau, 2007). Many others regard him as one of the most evil men who has ever lived (Wiker, 2008).

Also of note is the fact that modern historians of philosophy have tended to ignore the problem of the relationship between Nietzsche and Darwin, a fact "probably related to the appropriation of Nietzsche's philosophy by the Nazis" (Gayon, 1999, p. 155). Furthermore, historians have also "tended to ignore the connection between Nietzsche and the Third Reich" (Gayon, 1999, p. 155). The fact is "Eugenics, grounded as it was in scientific research, appeared to confirm empirically what Nietzsche had grasped philosophically" (Stone, 2002, p. 65).

Nietzsche's Criticism of Darwin

Nietzsche did recognize some of the major scientific flaws in Darwin's theory. For example, he had no problem with natural selection, but did with the idea that nature was the agent—noting that the "winners" were often not the most numerous individuals, but rather were a minority that was actually in some ways the weakest humans. As evidence for this, Nietzsche noted that the less complex organisms (protists, insects, invertebrates) were more numerous than the more complex organisms (humans and vertebrates in general), which were far less numerous (Gayon, 1999, p. 167).

Furthermore, Nietzsche had a problem with one aspect of Darwin's "survival of the fittest" notion, noting that it begged the question—the fittest for what? (Cate, 2005, p. 355). Nietzsche noted that it was "often those who were least fitted to survive in a strictly physical sense—geniuses who died prematurely" that were actually more fit (Cate, 2005, p. 355). He also noted that the weakest majority were most likely to mate and produce offspring precisely because they were the majority and, he concluded, most organisms indiscriminately mated with each other (Call, 1998).

These factors, though, were all the more reason why eugenics was important to Nietzsche. He believed that Darwin as a whole was not wrong; he was wrong only about some parts of his theory. Nevertheless, Nietzsche argued that Darwin's ideas must be applied by human intelligence to society. Brobjer (2004, pp. 166–167) even concluded that Nietzsche was "arguably more faithful to a Darwinian approach" than were many theorists and, in many ways, he was an "ultra-Darwinist" in spite of presenting arguments against certain aspects of Darwinism.

Summary

Nietzsche's philosophy is the antithesis, not only of the Biblical "all men are descendents of Adam," but also of the philosophy of the American government and that of many other governments that teach all persons must be treated fairly and with respect and dignity. He embraced the basic Darwinian concept with "relish" and went beyond Darwin to advocate a philosophy adopted by governments ranging from Nazi Germany to Communist China and the Soviet Union (Cate, 2005, p. 355).

His book *Beyond Good and Evil* was rated by Wiker (2008, p. 99–114) as one of the top ten books that "screwed up the world." Nietzsche's work also had a profound influence on the worst slaughter of humans in the history of humankind, the Holocaust and World War II. It also had a major adverse influence on academia and philosophy and contributed to ushering in post-Christian philosophy.

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Book Review

Censored Science, The Suppressed Evidence

by Bruce A. Malone

Search for Truth Publications,
Midland, MI, 2009, 112 pages,
$30.50.

This hardcover, beautifully illustrated book covers three important areas in the evolution-creation controversy: biology, geology, and cosmology. A significant feature in the book's layout is the concept of two facing pages for each topic, complete with text, full-color picture, and a short paragraph called "Skeptics Corner." This layout by Bruce Malone and his staff has resulted in a book that is the perfect tool for urging high school and college students that the path of evolution is not true science and that the scientific realities of the Bible should be suppressed no longer.

The author consulted literature written by scientific creationists and evolutionists and shows that the time has come for the principles of science to be applied to evolutionary beliefs. This includes the fallacies of claims that the earth is billions of years old and that all life originated spontaneously from dirt and chemicals. The reader is introduced to the writings of Michael Behe, Martin Lubenow, Brian Thomas, Ian Taylor, Michael Denton, Andrew Snelling, Kurt Wise, John Morris, Michael Oard, and numerous others who have researched evolutionary literature, laid bare the false claims, and presented facts to show that evolution has never been a fact.

Under the heading "Folded Mountains," Malone writes, "Throughout the mountain ranges of the world, there are enormous layers of sediment which have been bent and folded without breaking. This could only happen if these mountains were uplifted while the sediment was of a soft, pliable, mud-like consistency" (p. 54). He then tells the evolutionary story about the hundreds of millions of years needed to accumulate the sediment and how it would be rock hard and would break under the enormous upward pressures. In contrast, the Biblical record describes a worldwide flood that resulted in a rapid accumulation of sediment that can account for the folded rock now visible.

Under the heading "The Mystery of the Woolly Mammoths," Malone writes, "Skeptics have not been able to come up with a model of earth history that adequately explains either the cause of the ice age or the demise of the mammoths" (p. 68). He then supplies the reasoning given by Michael Oard for the existence of semitropical vegetation found undecayed in the mammoth stomachs, and the scientific rationale for the existence of the mammoths in the frozen north in the first place.

Using this logical approach, the author describes fifty of the most convincing scientific evidences that we have a Creator God and a Bible that has recorded the facts. Not content just to write this book and have it published, Bruce Malone, the full-time director of Search for the Truth Ministries, has traveled extensively in the United States and Europe, distributing copies free to teachers, students, missionaries, prisoners and the elderly.

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The Little Ice Age in the North Atlantic Region

Part I: Introduction to Paleoclimatology

Peter Klevberg and Michael J. Oard*

Abstract

It is widely held by both evolutionists and creationists that earth history includes periods of glacial advance known as "ice ages." In most cases, the extent, causes, and effects of an ice age are speculative excursions into undocumented natural history. The salient exception is the Little Ice Age, which extended into the beginning of the modern age of weather instrumentation and measurement. While evidence indicates the Little Ice Age was global, it was particularly well documented in the North Atlantic Region. This is particularly fortuitous for diluvialists, as this region provides an especially useful set of conditions for testing predictions of the rapid, postdiluvial Ice Age model. The first paper in this series reviews the methods used to study climates of the past, particularly their application to the Little Ice Age.

Introduction

Tremendous political pressure is now being exerted worldwide in the name of averting catastrophe from anthropogenic global warming. This often clouds scientific discussion of climate change. While predictions of soaring temperatures, coastal inundation, and desertification take the headlines, the preceding several centuries witnessed notable human suffering and even the demise of whole peoples due to the opposite problem, the Little Ice Age. Evolutionists largely believe that there have been many ice ages that have come and gone over thousands and millions of years. Most creationists believe there was a single, relatively brief ice age after the Biblical Deluge. Both of these positions are speculations without the aid of historiography. Their models need "calibration" from similar phenomena that can be or have been observed. The Little Ice Age, particularly as witnessed in the North Atlantic region, provides a singular means of evaluating ice age models and geologic features inferred to be glacial, as well as postdiluvial climatology in general. This paper presents the historical and scientific methods used to research climatology and glaciation, with particular reference to the North Atlantic region and the Little Ice Age.

Climatology—A Hot Topic

The winds of opinion regarding climate change have reached such strength that it is often difficult for scientists to venture into meaningful, fact-based discussions. Popular magazines such as *Time* (Kluger, 2006) hype global warming and make it seem that every disaster can be blamed on global warming, or "climate change" as it is now being called. The public is becoming carried away with the fear of global warming, so much so that one woman claims to have aborted her baby to reduce her "carbon footprint." Practically every issue related to global warming has been distorted (Lomborg, 2007). Those scientists who have become skeptical that man has caused all

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the global warming are often labelled as "working for the energy companies" (Gore, 2006, pp. 284–287).

Is *Little Ice Age* Hyperbole?

Global warming or even *climate change* is a meaningless term, scientifically, without a datum for comparison. Similarly, whether the term *Little Ice Age* is overdrawn depends on how it is defined. What was the Little Ice Age? We employ the definition of Grove (Ogilvie and Jónsson, 2001): the Little Ice Age was a period of widespread glacial advance on a global scale during the past millennium. While colder temperature is generally linked with glacial advance, it is not the only climatic factor. The Little Ice Age did not appear or disappear overnight, of course, but is generally agreed to have occurred from about the middle of the 1300s to the middle of the 1880s.

The Little Ice Age was a disputed concept even before it was over. Such leading lights as Thoroddsen in Iceland and Fridtjof Nansen in Norway held to the school of "uniformitarians," who believed the range of weather of the 1800s was typical and denied the existence of the Medieval Warm Period or significant, century-scale climate change. This skepticism was soundly dispelled as the Little Ice Age ended, especially by the notable warming from the 1920s to 1950s (Ogilvie and Jónsson, 2001).

Some have objected to the term "Little Ice Age," claiming it is a misnomer, ambiguous, not a worldwide phenomenon, lacking continental glaciation, or disproven by a lack of sustained low global temperature (Grove, 1988; Mann, 2002). Some use the term (or the synonyms *Fernau* and *Kleine Eiszeit*) grudgingly (Ogilvie and Jónsson, 2001). A tendency among global warming advocates is to downplay the Little Ice Age and to give it a more regional extent (Mann, 2002).

While popular computer-generated temperature curves, particularly the Mann et al. (1999) "hockey stick" popularized by the Intergovernmental Panel on Climate Change (IPCC) publications, have "smoothed out" much of the Little Ice Age temperature record, there is no smoothing out history. As will be documented in later parts of this paper, ice advanced in Iceland, Norway, Greenland, Switzerland, and other lands, overrunning farms and villages.

> On several occasions between 1695 and 1728, inhabitants of the Orkney Islands off northern Scotland were startled to see an Inuit in his kayak paddling off their coasts. On one memorable occasion, a kayaker came as far south as the River Don near Aberdeen (Fagan, 2000, p.116).

The Kattegat (strait between the North and Baltic Seas) froze over, and the Swedish army crossed the ice to defeat the Danes in 1658 (Rian, 1994). Crops failed frequently throughout Europe, and particular crops could no longer be grown as far north as they had been previously (Fagan, 2000). The Russians turned their deadliest weapon—winter—on Napoleon in the great French defeat of 1812. These were tangible—all too tangible—effects of significant, century-scale climate change.

Our focus on the North Atlantic region is not based on belief that the Little Ice Age was limited to this area. It was global, as will be shown in Part II of this series. However, we also recognize the validity of some of the criticisms by those who take issue with the term "Little Ice Age." Some of these objections are based on differences from the inferred Great Ice Age (or ice ages) that will be the focus of Part VII in this series.

While large continental ice sheets outside of Greenland and Antarctica have never been observed, we will not dispute that they have existed in North America, Northern Europe, and Russia. Instead, in Part VII of this series we will compare what was observed in the Little Ice Age to what would be necessary for such large continental ice sheets to form.

Importance of the Little Ice Age

Without the Little Ice Age, natural history speculations about climate change, particularly ice ages, would remain poorly constrained. The Little Ice Age provides an invaluable means of applying more science to our speculations.

Importance to Climatology

The present time provides an unparalleled emphasis on climatology in general and climate change in particular. Fears of global catastrophe caused by global warming have induced many to propose significant, restrictive legislation (Conant et al., 2007; Gore, 2006). Whether present and proposed actions are too little or too much cannot be known without defensible data regarding climate change. While the present state of climatology, particularly in regard to climate models, may be inadequate to reach an informed conclusion anytime soon (Posmentier and Soon, 2005), the Little Ice Age provides an adequately documented period of climate change significant enough to reach preliminary conclusions. Although the modern perception of increased natural disasters is largely baseless (Austin, 1998; Cerveny, 2005), the profound effects of the Medieval Warm Period and Little Ice Age were real.

Importance to Glaciology

Since the work of early creationist glaciologist Louis Agassiz in the 1800s (Imbrie and Imbrie, 1979), most glaciological investigations have proceeded on relatively steady state conditions on alpine glaciers. Fluctuations in glaciers, particularly the large-scale recession since the Little Ice Age and also surging glaciers, have provided opportunities to expand our knowledge of the physics and climatology of glaciers.

Importance to Geology

Much of glacial geology has been natural history speculation rather than geologic science (Klevberg, unpublished data). Glacial landforms and deposits have been largely inferred rather than observed. The Little Ice Age provided a large-scale opportunity to redeem glacial geology by observing geologic effects of known historic events.

Importance to Understanding Natural History

Earth history is not the primary theme of the Bible or of the better books of history written in more recent times. Earth history lacks the detailed historiography of political history, yet it is important to humanity in a fundamental way, both reflecting and undergirding one's worldview. The Little Ice Age provides data for testing some of the conclusions one may draw from the disparate natural histories of traditional naturalism and Biblical Christianity.

Methods in Climatology and Paleoclimatology

Weather fluctuates constantly and differs markedly in time and space. It is a fascinating field of study, filled with complexities and many mysteries yet to be solved (Oard, 1997a). Climate is the long-term environmental average of weather and thus more predictable; however, climate too varies greatly in time and space. Paleoclimatology is the study of past climate, in particular climate before the advent of instrumental records.

Instrumental Data

Instrumental data and observations provide the only *direct* means of studying climate. Were instrumental data available for the entirety of the past millennium, the need for proxy data would be slight. Since instrumental records are available for only approximately the past century, proxy data are necessary. The spatial distribution of instruments, while much better than it was previously, remains less than ideal. The length of each instrumental record usually differs from the next, creating additional statistical problems (Juckes et al., 2007). Changes in instruments, recording stations, and surrounding land use have all affected instrumental data and must be compensated for in a careful paleoclimatologic analysis.

Proxy Data

Proxy data fill voids in the instrumental record. They fill voids in the historical record also and provide a level of specificity lacking in early historiography. Proxy data are used to develop transfer functions to infer temperature or other climatic variables, and these transfer functions are then used to develop climate models (see Figure 1).

Why Proxy Data Are Needed

Instrumental data for most regions stretch back only a century or so. One exception is Iceland, where the first instrumental records date from the 1700s and are continuous starting in the 1800s (Jónsson and Garðarsson, 2001). In many parts of the world, the instrumental record is much younger, and spatial coverage is greatly lacking, especially over oceans. Thus, both in time and space, proxy data are essential for inferring the paleoclimate.

Types of Proxy Data

Types of proxy data, with instrumental measurements for comparison, are summarized in Table I. Instrumental records are the only *direct* records of climate, but they are very limited both temporally and spatially in the past millennium, the time of the Medieval Warm Period and Little Ice Age. The minority of proxy methods are *historical* records, records compiled by contemporary observers or directly linked to them. The majority of proxy methods are indirect methods that rely on natural history presuppositions—radiocarbon dating, dendrochronology, paleomagnetism, etc. These methods are often combined in practice, which potentially increases their precision and reduces their accuracy (by multiplying the errors in the different methods).

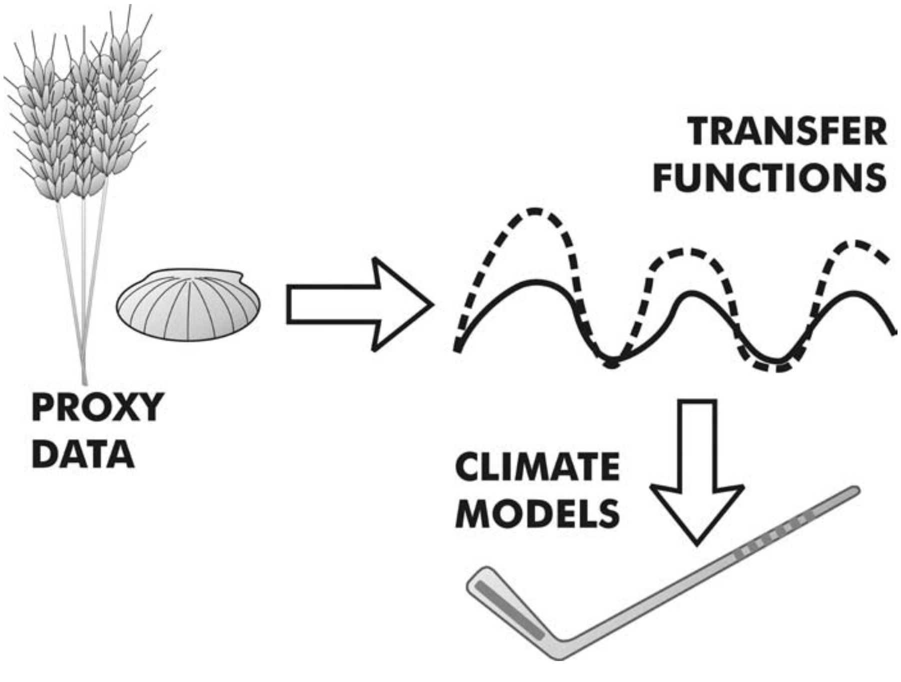

Figure 1. Illustration of how proxy data are used to generate a model.

Table I

Data Type	Direct?	Historical?	Dependencies	Limitations	Interferences
Instrumental	Yes	Yes	Spatial	Records begin after peak of L.I.A.	Urban heat island, station moves
Weather diaries	No	Yes	Observer bias	Few available, short periods of time, largely qualitative, little overlap	Changes in observers, hiatuses
Crop records	No	Yes	Must be same varieties	Must have been grown in same area over prolonged period.	War, disease, changes in crops and crop practices.
Datable organic remains	No	Yes	Accuracy of dates	Very few historically dated materials available	Historic reuse may result in false assumption of first date
Ice in harbors, rivers	No	Yes	Favorable climatic conditions	Continuous historical records must be available	Stream diversion, land use changes, or other major anthropogenic influences
Art work, narratives	No	Yes	Historical realism	Accuracy of original work, dating of work, availability	"Artistic license," artistic ability, accuracy of dates
Lichenometry	No	No	Observer bias, species present, preservation of individual organisms	Need for recognizable moraines or other extent indicators; significant variation in quality of work between observers	Erosion or other factors removing largest lichens, differences between species, climatic or other changes impacting calibration curves
Benthic organisms	No	No	Knowledge of taxonomy and habitat; typically anchored to ^{14}C	Must have adequate sample population and representative sampling	Erosion, sampling problems, any ecologic changes unrelated to climate
Ice cores (δ^{18}O, etc.)	No	No	Dating largely subjective interpretation assuming annual fluctuations	Layers too thin for accurate distinction beyond several centuries	Isotopic mixing may blur signal or shift it.
Sea sediment cores (δ^{18}O)	No	No	Dating largely subjective interpretation assuming annual fluctuations	Thinness of layers, sampling methods, methods of distinguishing layers	Isotopic mixing may blur signal or shift it.
Speleothems (δ^{18}O, etc.)	No	No	Dating largely subjective interpretation assuming annual fluctuations; requires steady supply of mineral-rich water (no interruption)	Not many speleothems of adequate age available	Interruption of water supply may produce multiple layers in one year or missing years

Table I (continued)

Data Type	Direct?	Historical?	Dependencies	Limitations	Interferences
Dendrochronology	No	No	Depends largely on subjective ring matching; relation of tree to moraine important	Must have adequate quality sample from stump or other means of identifying it with glacial event	Reworked wood, decay, mismatching of rings between specimens, microclimatic effects during wood formation
^{14}C dating of wood in moraines	No	No	^{14}C rife with problems, wrong assumptions; wood must be recognizably buried by glacial action at time of death	Same as above plus lack of processes affecting carbon isotope ratios	Reworked wood, ground water and other "old carbon" effects
^{14}C dating of soils, peat, etc.	No	No	Same as above plus problematic nature of dating soil carbon	Soil horizon or organic layer must show evidence of having been buried by glacier at time of death/preservation	"Old" carbon may produce errant results, soil chemistry may interfere
Paleolimnology	No	No	Must have lake with relatively closed-basin conditions for accumulation of sediments; typically dependent on ^{14}C dating	Suitable only for some lakes; requires relatively undisturbed sample, effective means of accurately distinguishing layers	Isotopic mixing, changes in land use or other factors impacting sedimentation that are unrelated to climate
Palynology	No	No	Above but also must have consistent and adequate contribution of pollen	Preservation of pollen grains must be adequate in quality to permit identification and adequate in quantity to permit estimation of ecologic balances	Same as above, plus disease, land use changes, other impacts to plants unrelated to climate
Paleomagnetism and mineralogy	No	No	Similar to sea and lake sediment dependencies plus climate - mineralogy relationships	Same as sea sediment cores and paleolimnology plus ability to accurately measure magnetic susceptibility and paleomagnetic orientation.	Changes in mineralogy unrelated to climate (e.g. sediment sources); paleomagnetic interpretations typically based on uniformitarian assumptions

Ice cores have been relied upon greatly for paleoclimatologic research. The best known are the ice cores from Greenland, though Svalbard, Antarctica, Quelccaya in the Andes, and other locations have also contributed ice core data (e.g. Grove, 1988; Kekonen et al., 2005). In recent years, huge quantities of ice core data have been amassed (cf., Kjøllmoen, 2007; NORPAST, 2001; Oard, 2005). While some studies appear to put great weight on interpretations of ice core data (Mann and Jones, 2003), others indicate this is misplaced confidence (Juckes et al., 2007; Oard, 2005).

Dendrochronology is one of the most important proxies for the past millennium. Historically documented glacial advance and retreat in Switzerland correspond remarkably well with tree ring density curves (*Picea*), with notable glacial advances when summer temperatures were on average 1°C cooler than the long-term average (Grove, 1988; Paulsen et al., 2000). Trees respond primarily to accumulated summer temperature (Stötter et al., 1999).

Difficulties with Proxy Data

As shown in Table I, virtually any proxy data set is accompanied with minor or major problems. In addition to natural limitations of these various methods, such as lack of temporal or spatial coverage, serious methodological problems may be present too. These are largely related to assumptions that must be made about the past, with the result that error may increase significantly the further back in time the data are projected (Bradley and Jones, 1993; D'Arrigo et al., 2006; Rutherford et al., 2005; Schmutz et al., 2000).

A common problem with proxy data is comparability. Proxies such as tree rings, crop records, and pollen may give an idea of the average summer temperature, the peak summer temperature, or the length of the growing season, but they will not provide information on the severity of winters. Ice in harbors or rivers may provide an idea of the severity of a winter or the length of the winter, but without necessarily being able to differentiate between them. Written records are usually necessary to differentiate between such input variables, potentially producing some rather unusual but usable proxies (Vasey, 2001).

Many proxies respond to a variety of variables, not just temperature (or precipitation, or another variable of interest). Proxies can be as diverse as borehole temperatures and beetle species (Buckland and Wagner, 2001), but they can respond to variables as diverse as deforestation and detergent, and care must be exercised in interpreting each one.

Transfer Functions

Transfer functions provide a mathematical relationship between proxy data (e.g., duration of ice on a lake, length of growing season, oxygen isotope ratios) and the variable of interest (e.g., average annual temperature, average winter temperature, minimum summer temperature). Transfer functions by definition are intended to extend the relationships observed historically between environmental variables into the unobserved past. They are therefore forensic by nature and enter the realm of *natural history*, in which scientific methods are adjuncts, subservient to the methods of historical study (Adler, 1965; Reed et al., 2006). The assumptions that are employed in that historical study—whether uniformitarianism, catastrophism, or diluvialism—may significantly influence the way the transfer functions are formulated and applied. The further back in time one speculates, the greater the potential error in the inferences.

Some of the most important potential sources of systematic error are radioisotope dating (especially carbon 14) and dendrochronology, as these are heavily dependent on uniformitarian presuppositions and widely used to "calibrate" various transfer functions. Transfer functions are generally calibrated to the instrumental record, but many transfer functions derived from various proxies are "calibrated" to radiocarbon dates or tree rings due to the limited instrumental record (see nearly any paper on medieval or earlier paleoclimatology). Creationists have done significant research on the validity of radiocarbon dating, and documentation of the flaws of the method is beyond the scope of this paper. Note that errors in dating will result in errors in derived transfer functions, and these errors will be propagated in climate models based on these transfer functions. Appendix A presents a more detailed presentation of the effects of ^{14}C dating and dendrochronology on transfer functions. Another method used to "calibrate" transfer functions is varve chronologies. That these are likely to be highly inflated and may well represent non-annual rhythmites (at least in the vast majority of cases) has been demonstrated elsewhere (Oard, 1997b; 2009). Paleolimnology (lake sediment) studies have produced problems by attempting to evaluate sediment cores stratigraphically and based on paleomagnetic correlation. These problems are acknowledged by establishment researchers (NORPAST, 2001, ss. 2.2.1, 4.3, 5.1).

Data are typically "smoothed" to make them more comparable to other data and to make trends easier to observe. "Smoothing" often consists of generating running averages (Figure 2) and graphing them (Figure 3) to remove the wild short-term swings typical of weather. Other statistical methods may be applied; some of these are less self-evident and could be prone to bias (Esper et al., 2005). "The results of calibrating any proxy data depend on whether raw or smoothed records are used and on the chosen seasonal temperature predictand" (Briffa and Osborn, 2002, p. 2228). Varying approaches in calibrating proxy data to temperature records (i.e. transfer functions) can produce very different climate models (Esper et al., 2005; Juckes et al., 2007).

Principal Component Analysis

To create a climate model that can be programmed into a computer and used to infer the past or predict the future requires a means of effectively combining transfer functions. These functions are evaluated for "predictive skill," i.e., how well they match observed data. A combination of transfer functions, often from diverse proxies assembled in the form of a "neural network," can be compared with data from the instrumental

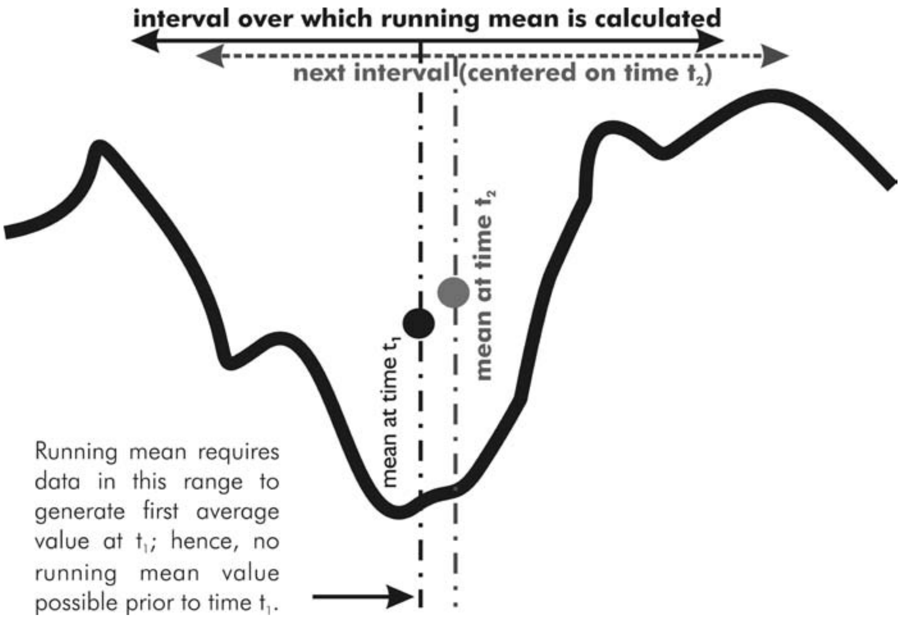
interval over which running mean is calculated
next interval (centered on time t_2)
mean at time t_1
mean at time t_2
Running mean requires data in this range to generate first average value at t_1; hence, no running mean value possible prior to time t_1.

Figure 2. Generating a running mean.

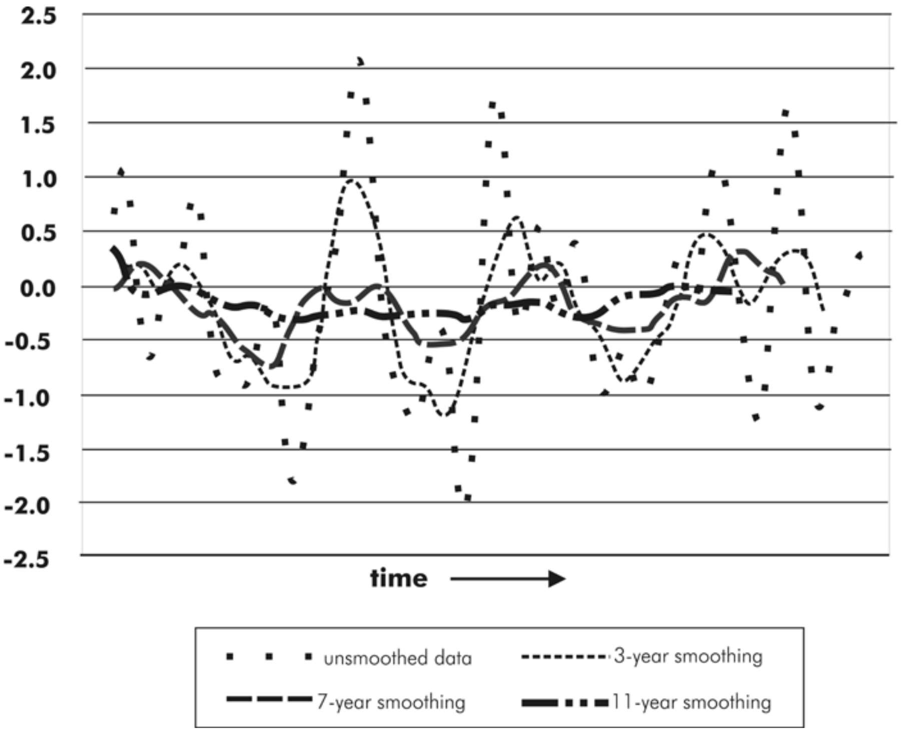

Figure 3. Smoothing data using running means.

record for a calibration period and an eigenvector analysis performed (similar to geologic applications; e.g., Klevberg and Oard, 2005). The empirical eigenvectors, often referred to as "principal components," provide the strongest "signal" amidst the ubiquitous "noise" of the highly complex data representing weather and climate patterns. They are heavily influenced by the choice of proxy data and the weighting given the different data sets. Principal component analysis is a necessary step in developing and optimizing transfer functions. Readers not familiar with principal component or eigenvector analysis may wish to read Appendix B.

Modeling

Once the eigenvectors have been derived from the overall data set, they can be assembled into a model. A model might be represented thus:

$$F = P_1 + P_2 + P_3 + P_4 + P_5 + R$$

Where the overall function is a combination of five (or some other number) principal components (i.e., empirical eigenvectors) and some remainder or "noise" term. The success of the model is judged on the basis of the correspondence between these principal components and observations and is evaluated against a verification period of the instrumental record that differs from the calibration period (otherwise, it would be tautologous). Thus, the longer the calibration period, the better should be the resulting model, but at the expense of the verification period and vice versa.

Figure 4 shows some of the most prominent climate models for the past millennium. To a large extent, these models have been derived from the same data. Of course, the models are only as good as the transfer functions upon which they are based and the proxy data from which the transfer functions are derived.

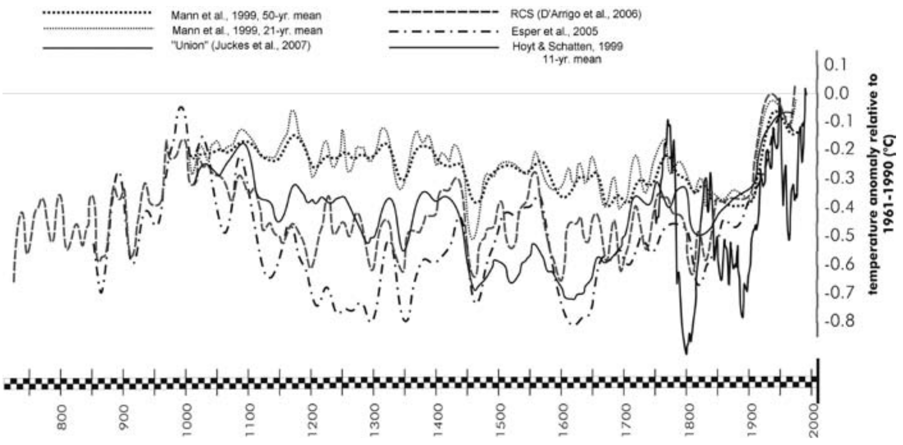

Figure 4. Graph comparing notable models for Northern Hemisphere average land surface temperature.

To Each His Own: History Versus Science

As has been presented elsewhere (Klevberg, 1999; Reed, 2001; Reed et al., 2004), the battle over natural history is not a battle between science and religion but a battle between two incompatible worldviews (Morris, 1989; Ham, 1987; Mortenson, 2004; Reed, 2005). Disagreements over paleoclimatology are a subset of this larger incompatibility.

Essential Philosophic Distinction

Evidence is not all cut from the same cloth; there are different types of evidence (Tyvand, 2009). History is not science, yet paleoclimatological studies must partake of both. There are different methods that must be combined, each method in its own sphere, to properly evaluate "mixed questions" (Adler, 1965) such as we shall investigate in this series. This essential philosophic distinction is typically ignored, glossed over, or outright denied by evolutionists and all too often overlooked or misunderstood by creationists (Reed and Klevberg, in press).

Models Versus Historiography

As we have attempted to make clear in this paper, we believe there has been too much emphasis on sophisticated expression of opinion—models—and too little careful historical analysis. Paleoclimatology is the study of history using the tools of modern climatology and atmospheric science; it is a branch of history, not science. In historical study, the most import must be placed in the testimony of eyewitnesses (Deut. 17:6, 19:15–19; Ruth 4:9–11; 1 Sam. 12:5; Isa. 43:9; Jer. 32:10; Matt. 18:16; John 1:7, 5:31–39; Acts 1:21–22, 2:32, 10:39; 2 Cor. 13:1; 1 Tim. 5:19; 1 John 5:7–8) rather than speculations, even if the speculations are our own. If historical accounts that appear to be well attested and consistent seem to indicate certain conditions prevailed at a given time, and one's climatic model suggests otherwise, the burden of proof is on the model. None of us was there at the time.

Which Bias Is the Best Bias to Be Biased With?

Since paleoclimatology must inevitably move from the realm of science into the realm of history, it will inevitably be affected by the natural history worldview held by the researcher. Bias is inevitable, but the bias and the potential effects of the bias should be recognized openly. As creationist speaker Ken Ham is well known for saying, "Which bias is the best bias to be biased with anyway?" Differences in conclusions regarding past climate may well result from these different biases.

Data Selection

Diluvialists will want to place the heaviest possible emphasis on historical records. This is not to deny the potential for errant historiography or that light may be cast on the veracity of a historical account by the use of other proxy data. We have junk historiography aplenty today, just as we have junk science, but this is nothing new. Historians have always varied in their reliability; we have Tacitus, James Ussher, and Arnold J. Toynbee, but we also have Michel Foucault, Hayden White, and Joan W. Scott. Nonetheless, when it comes to the unique and unrepeatable phenomena of history, the methods of historical research must govern, and good historical records can be found. The level of confidence exhibited by some in speculative transfer functions and models, sometimes contrary to historical records, is not justified and should not be emulated.

All proxy data sources require the kind of careful review that should typify a historian, whether they are data more familiar to scientists or traditionally the realm of historians. For example, economic results are sure to be recognizable from a major climatic deterioration (Vasey, 2001), but climate change may be only one factor (Rian, 1994).

Transfer Functions

Diluvialists will be much less inclined to extrapolate transfer functions or calibrate them to dubious dating methods. Instrument measurements over the past 100 years and historical records should be given greatest weight when developing transfer functions. These should be used to evaluate the veracity or applicability of statistical methods (cf., Esper et al., 2005).

Eigenvector Analysis

The mathematics of eigenvector analysis or principal component analysis are not a matter of controversy. What is a potential source of disagreement is the rigor with which statistical methods are applied, especially to individual data sets, and the weighting given to different data sets. Many proxy data sets have "holes" that may require careful analysis to "bridge" before an eigenvector analysis can be performed, a step that has not always been properly performed in climate modeling (McKitrick, 2005). Differences that may result from bias during such "hole filling" are illustrated in Figure 5.

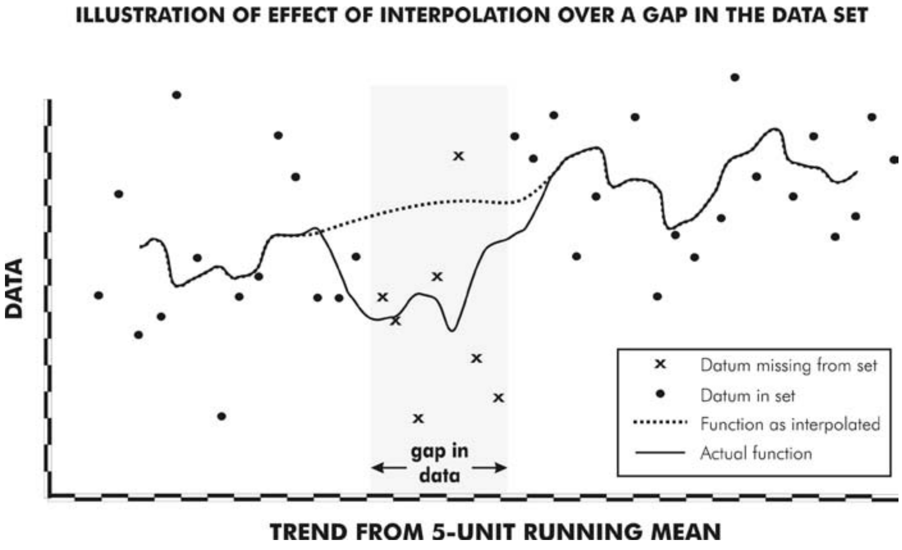

Figure 5. Comparison of curve inferred across data gap with actual data. (Data are hypothetical for illustrative purposes only.)

Modeling

The predictive skill of currently popular climate models is quite low (Posmentier and Soon, 2005). Models developed to reflect land surface temperatures fail to reflect the actual observations in the troposphere (Michaels, 2005). These models are merely sophisticated tools to help us better understand climate change, and none of them truly represents the history of climate. Diluvialists, free from blind commitment to uniformitarianism and its predicted gradualism, will be less inclined to trust in computer models and inclined to put more confidence in historical records.

Summary

The specter of climate change has taken center stage in recent years, yet no meaningful study of climate change is possible without a datum for comparison. This requires historical study of climate, and the most notable climatic phenomenon of recent centuries was the Little Ice Age, which lasted from roughly the mid 1300s to the mid 1800s. While proxy data are necessary to infer the state of climate over most of the past millennium, the latter part of the time period is covered by instrumental records, and the best proxy

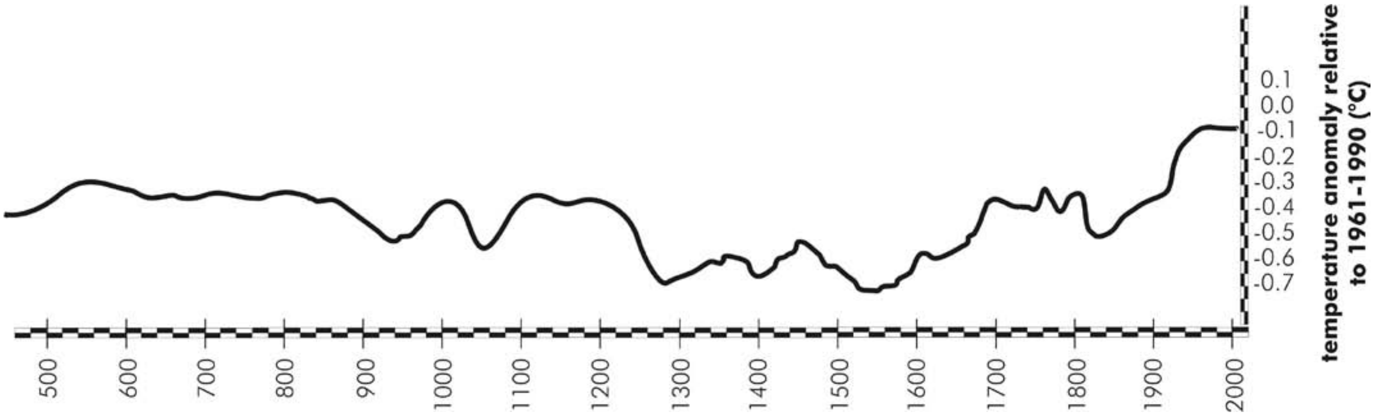

Figure 6. Illustration of "stretching effect" back in time due to uniformitarian bias in transfer function. The curve is hypothetical, for illustrative purposes only, but is based on common Northern Hemisphere land surface temperature curves for the past millennium progressively stretched. This results in what appears to be "anomalously erratic behavior" in recent centuries while in reality it is not.

data for all paleoclimatologic research are—naturally—from the most recent centuries. This provides a great means of tempering earth history speculation with fact. Paleoclimatology is a branch of history, addressing the "mixed question" of past climate with the tools of both historical and scientific study. Biases strongly affect the collection, interpretation, and application of proxy and other data. Models are not neutral. The Little Ice Age has great relevance to questions of natural history, to the study of climate, glaciers, and geology, not only in the North Atlantic region but also in many other parts of the world.

Outline of the Series

Part I	Introduction to Paleoclimatology
Part II	Magnitude, Extent, and Importance of the Little Ice Age
Part III	Iceland
Part IV	Norway
Part V	Greenland
Part VI	The Little Ice Age and Climatology
Part VII	Constraints on the Great Ice Age
Part VIII	Geologic Observations

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CRSQ: Creation Research Society Quarterly

TJ: formerly *Creation Ex Nihilo Technical Journal*, now *Journal of Creation*

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Appendix A: Calibration of Transfer Functions

Two common methods of attempting to calibrate transfer functions for long-term proxy data are radiocarbon dating and dendrochronology. Both of these methods have received attention from creationist researchers for quite some time. Changes of frequency of natural events or cycles are often spoken of in the literature and may simply reflect the stretched-out uniformitarian chronology (Eiríksson et al., 2000; Rose et al., 1997; NORPAST, 2001, Appendix 1).

Carbon 14

That radiocarbon dating is beset by problems is well known to creationists, though some find it overwhelmingly convincing (Aardsma, 1991). Many creationists have long found it somewhat useful, especially if corrected for atmospheric disequilibrium (Whitelaw, 1970). Some of the factors affecting the ratios of ^{14}C to ^{12}C include:

- Atmospheric disequilibrium (production exceeds decay)
- Carbon reservoir effects (exchange with "old" carbon)
- Fluctuations in strength of the earth's magnetic field
- Sunspots or other fluctuations in incident solar radiation
- Introduction of errors by "calibrating" ^{14}C to errant dendrochronological or tephrochronological markers (i.e., errors in one of these methods are then imported into the ^{14}C chronology)
- Potentially very significant changes between the antediluvian and postdiluvian ^{14}C:^{12}C ratio.

Dendrochronology

Dendrochronology may be pursued based on ring width or ring wood density. Calibration curves must be developed for the local growth conditions (Guiot et al., 2005), since as trees age, rings become narrower (for constant wood volume). Rings matched between different trees believed to have overlapping lifetimes must also be corrected for individual growing conditions since, for example, a given tree may have slowed in growth due to shading by other trees even as growing conditions improved. An individual tree may have suffered from attack by insects or disease while another individual may have remained unaffected. Removal of an overtowering tree may have released light for a shorter tree, with resulting accelerated growth.

Some of the factors affecting longtime reconstructions using tree rings include:

- Subjective elements in matching tree rings from specimen to specimen
- Microclimatic differences in growth conditions for different specimens
- Individual differences in growth histories (e.g., loss of a shading tree resulting in increased growth rate)
- Possible multiple annual rings (e.g., *Pinus longæva*)
- Matching ring sets inferred to be noncontemporary due to use of errant ^{14}C "dates" (i.e., the ring sets between two specimens actually do overlap but are placed at different times due to reliance on ^{14}C dates that are incorrect)

When dendrochronology is used as a proxy for growing-season temperature, it is needful that the forest chosen is one that is temperature limited. This appears to be true in general of the high-elevation Scandinavian forests (Kalela-Brundin, 1999) and high-latitude Russian forests (MacDonald et al., 2000), where snow provides excess moisture each year (Linderholm, 2001) but not of the Bristlecone Pine (*Pinus longæva*; also *P. aristata* and *P. balfouricana*) stands, which appear to respond more to moisture and carbon dioxide than temperature (McIntyre and McKitrick, 2005; Woodmorappe, 2003a). The *Pinus longæva* chronology may well be a significant factor in development of the controversial Mann et al. (1998) "hockey-stick" model (see also, Mann, 2002; Mann et al., 1998; 1999; 2004; McKitrick, 2005; and McIntyre and McKitrick, 2005), demonstrating the care that needs to be exercised in applying dendrochronology to paleoclimatology.

Selected ^{14}C and Dendrochronology Bibliography

General problems with ^{14}C: Lillehammer (1994, p. 25); Whitelaw (1993).

Atmospheric disequilibrium in ^{14}C: Brown (1990; 2006); Cook (1970).

Carbon reservoir effects: Bakke et al. (2005, p. 530); Fischer and Heinemeier (2003); Woodmorappe, 2003b.

Hard water effects: Heier-Nielsen et al. (1995); Smittenberg et al. (2004).

Terrestrial magnetic field effects: Grove (1988, p. 367).

Solar irradiance or other radiative effects: Grove (1988, pp. 366–367); Baliunas (2005).

Problems dating soils: Grove (2001, p. 55); Klevberg et al. (2009, pp. 88–89).

Necessity of correcting ^{14}C dates for moraines, etc.: Bakke et al. (2005); Rose et al. (1997).

Out-of-order ^{14}C "dates": Bakke et al. (2005, p. 525); Gobet et al. (2005, p. 674).

Multiple rings in bristlecone pine: Aardsma (1993); Lammerts (1983); Matthews (2006); Woodmorappe (2004).

The "segment length curse" and calibration curves in ring matching: Juckes et al. (2007).

Ring-matching problems in bristlecone pine and other species: Woodmorappe (2003b); Klevberg, unpublished data.

CO_2 fertilization of bristlecone pine: Juckes et al. (2007); McIntyre and McKitrick (2005).

^{14}C dating of trees: Woodmorappe (2001).

Calibrating radiocarbon using dendrochronology: Brown (1995).

Other calibration methods in common use are "varves" (assumed annual silt-clay couplets in proglacial lakes) and ice cores (Gobet et al., 2005, p. 673; Ice Core Working Group, 1998; Smittenberg et al., 2004). Significant calibration problems have arisen in efforts to apply "varves" to dating sediments (Menounos et al., 2005), and radiocarbon has proven superior. This is not surprising, as these methods are fraught with uniformitarian tautologies, as has been shown (Oard 1992a; 1992b; 1997b; 2009).

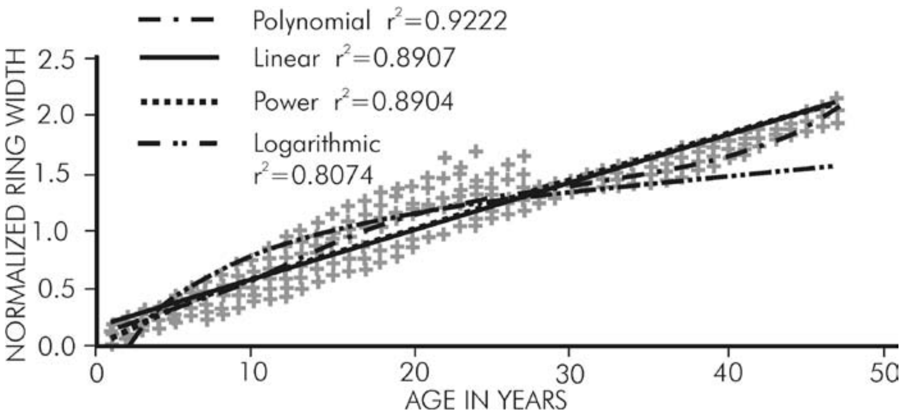


Figure 7. Example of four curves fit to set of actual tree ring data (from Klevberg, unpublished data). The higher the r^2 value, the better the fit.

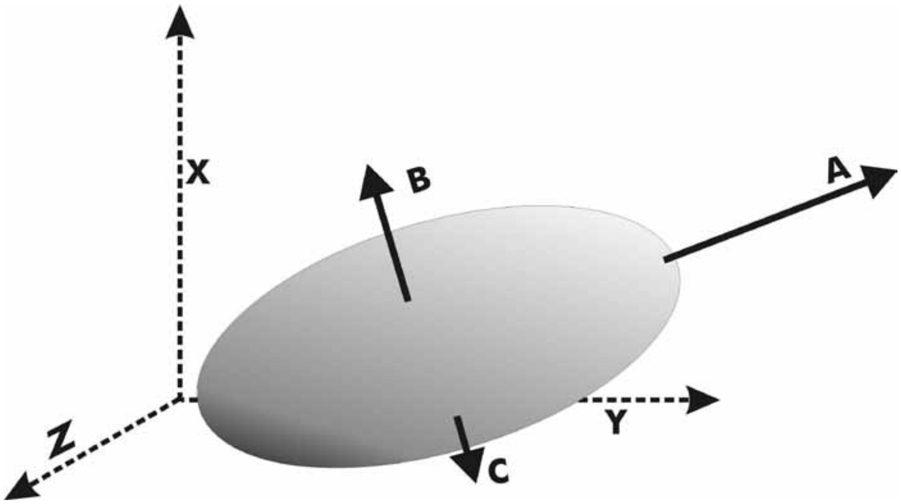


Figure 8. Simple illustration of application of eigenvector analysis: orientation of clasts (individual rocks) in Cartesian coordinates (x,y,z) can be described by three vectors aligned with the A-, B-, and C-axes (longest to shortest dimensions, respectively, of the clast). Eigenvector analysis provides a computational method to find which possible combination of orthogonal vectors produces the maximum and minimum axes (and thus mutually perpendicular third axis) of the rock. This same method can be used for many other types of data.

Appendix B: Introduction to Principal Component Analysis

Anyone who has worked with curve-fitting routines knows some of the limitations of these methods. Many natural decay processes are readily solved with exponential functions because they are related through first-order linear differential equations. "Noisy" data sets are not so tractable, and the common solution is to use a "brute force" approach with polynomial functions and let the computer "crunch" through the numbers using infinite series with a test criterion to determine what fit is "good enough." A rather neat grouping of data is shown in Figure 7 along with four types of curves: linear, polynomial, power, and exponential. The r^2 value provides an indication of how well a given curve fits these data. This is an entirely "instrumentalist" approach to the data–the resulting curve does not necessarily represent a "true" relationship between a given proxy data set and the temperature or other variable one is attempting to infer from those data.

Since there are many proxies to draw from and many variables that affect climate, no one transfer function will fit them all. There may be as many transfer functions as data sets. To obtain the fewest equations with the most explanatory power, there must be some means of determining how huge sets of often disparate data may be reduced to the smallest number of most "efficient" equations. This is a common objective in linear algebra and is reached through eigenvector analysis, which is explained

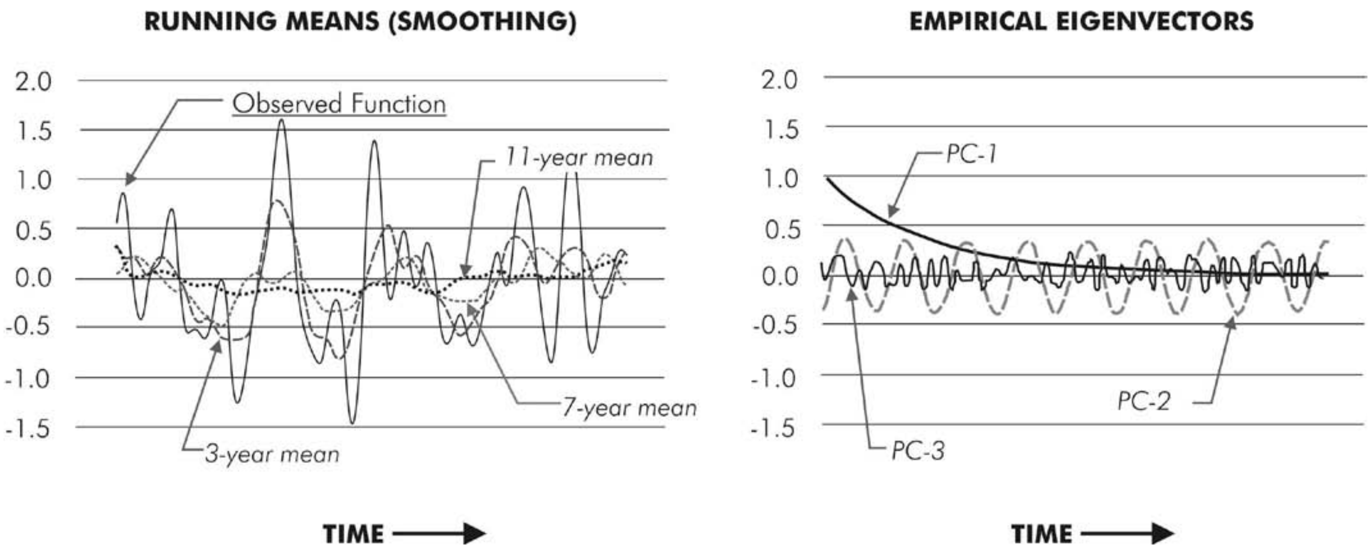
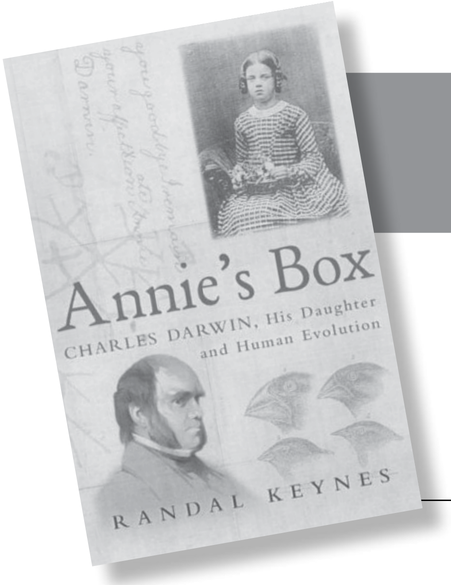


Figure 9. Deriving principal components (empirical eigenvectors) from smoothed data. Principal components and the "observed function" are hypothetical for illustrative purposes only. This made it artificially easy: the "observed function" was assembled from a linear combination of PC1, PC2, and PC3—a perfect fit! In actual practice, deriving the principal components may be much more difficult and much less successful.

theoretically in many linear algebra and other mathematical texts and in application in some scientific papers (e.g. Fisher, 2002). A very simplified example is provided in Figure 8.

Figure 9 shows a hypothetical function and the curves that result from smoothing. A perfect eigenvector analysis would produce principal components PC-1 through PC-3. In reality, the function on the left results from the combination of the three arbitrarily chosen functions (hence the perfect fit). Real data sets, especially climate data, are thick with noise terms that make the process more difficult.



Book Review

Annie's Box

by Randal Keynes

Harper Collins Publishers,
London, 2001, 331 pages,
$34.00.

This is the first book written by author Keynes, a great-great grandson of Charles Darwin. Keynes makes use of many Darwin family papers, both public and private. The book title comes from a small box that Keynes found among family heirlooms. It contained a thimble, a locket, ribbon, and stationery. These keepsakes belonged to Annie, the oldest daughter of Charles and Emma Darwin's ten children. This girl was the light of Darwin's life. When she became ill, primitive water and medical treatments of the day were not effective. Annie died at age ten, probably from tuberculosis. Charles never quite recovered from this loss and was unable to reconcile Annie's suffering with a loving God. Darwin surely needed a Biblical counselor to come alongside and help him through this time of despair, but it apparently did not happen.

The book chapters are filled with fresh Darwin family details and internal struggles. There is a wealth of lesser-known written Darwin quotes, many of them revealing Charles's disconnect with Biblical theology. During the HMS Beagle voyage, he remarked on tiny marine creatures, "It creates a feeling of wonder that so much beauty should be apparently created for such little purpose" (p. 23). Regarding the Bible, "For myself, I do not believe there has ever been any Revelation" (p. 282). When asked about God's design in nature, he replied "Well, that often comes over me with overwhelming force; but at other times, it seems to go away" (p. 286). Author Keynes adds that Darwin understood wife Emma's "hopes for reunion with her loved ones after death, but had no such hopes himself" (p. 286).

The book includes details on the final hours of Darwin as his heart failed at age 73. There is no mention of the urban legend that Darwin found deathbed reconciliation with his Maker. However, some of Darwin's final words are recorded by his daughter Etty as repeatedly saying "Oh God; Oh Lord God" (p. 292). Etty later remarked that these were only exclamations of distress and not a recognition of God's presence.

I will mention a further note of interest regarding Darwin's travels and discovery. He earlier was taught that species of plants and animals were relatively few and widely distinct, as observed in England. As he explored South America, Darwin was overwhelmed by the rich biodiversity. He concluded that living organisms must continually diversify, that is, evolve, without limitation. Darwin missed the truth that the Creator planned for variation within the distinct created kinds. He blurred the observed micro changes in nature with assumed macro changes.

An abbreviated time-line follows for the life of Darwin.

1809	Darwin is born on February 12, the same day and year as Abraham Lincoln.
1831–1836	The *HMS Beagle* sails to South America and the South Pacific.
1839	Darwin marries his cousin Emma Wedgwood.
1851	Annie, oldest Darwin daughter, dies at age 10.
1859	*Origin of Species* is published.
1882	Charles Darwin dies of heart failure at age 73.
1896	Darwin's wife Emma dies at age 88.

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CRS Conference Abstracts

July 23–24, 2010 • University of South Carolina Lancaster • Lancaster, SC

On July 23–24, 2010, the Creation Research Society held its second conference at the University of South Carolina Lancaster campus. Below are abstracts of presentations given during this two-day conference. Voting members of CRS were allowed to author or coauthor abstracts. All submitted abstracts were accepted, as the conference was intended to provide a forum for the free discussion of a wide variety of ideas pertaining to the creation model of origins.

Coordinating Committee:
Danny Faulkner, Ron Samec, Don DeYoung, and Kevin Anderson

Plenary Session

Bone Valley: The Genesis Flood and After

Tom DeRosa

Bone Valley is a designated region located in the central part of Florida encompassing four counties: Hardee, Manatee, Hillsborough, and Polk. The 105-mile meandering Peace River transverses this area, which has been classified as the most productive phosphate site in the United States. Its name is derived from the prolific fossil beds where many marine and terrestrial extinct creatures can be found such as megalodons, massive whales, and *Dugong dugon*, along with numerous land animals such as megatherium (giant sloths), glyptodonts (giant armadillo), Smilodons (saber-toothed cats), and ancestral Columbian mammoths. These fossil beds can be found reaching a depth of 20 feet and set upon the Hawthorne Formation, which is basically a layer of clay and sandy limestone deposits that have marine origins. Since the early 1990s, Creation Studies Institute (CSI) has been conducting fossil excavations tours in the southwestern region of Bone Valley along the Peace River. As the river water meanders through these fossil beds, it erodes many of the fossilized bones, exposing many of the disarticulated remains of both marine and land creatures. In 1996 the remains of the first Columbian mammoth were found by Greg Reuter on a CSI excavation in Arcadia. This was a noted exception in this area because the bones were articulated, belonging to the same creature. In the same site, after three years of intermittent excavations, three more individual mammoths' remains were found ranging from juvenile to mature adults with estimated height reaching up to 17 feet. Since then there have been more significant finds that affirm that this was a consequence of a worldwide flood and give an appearance of a post-Flood transition.

Design, Dawkins, and Dilemma

Jonathan Sarfati

In the year after Darwin's bicentennial, we face increasing atheopathic attacks on the Bible's account of history. Richard Dawkins supposedly wrote a conclusive case for evolution, *The Greatest Show on Earth*. But the design of all living creatures is out of reach of chance and selection and points to a Creator.

General Session

Will the Truth Prevail—How?

Horace D. Skipper

In the educational process, we want students to learn the "truth" on whatever topic is being taught and not just science courses. And yet, many frauds, half-truths, deceptions, and myths are (or have been) contained in textbooks for several generations or are presented in classes to support "a theory." Are the writers, reviewers, and publishers ignorant of the "truth," or are they willing to mislead the students to accomplish an agenda, to pursue social engineering, or to become a member of the elite?

The Christian foundation of the United States of America and the early Christian leaders of our nation have been largely undercut or portrayed as villains. And if you dare challenge the dogma being pushed in public education, you could become a prime target to be smeared as anti-education, anti-students, anti-science, and more.

We as Christians and citizens of the USA have an obligation to not only seek the "truth" but also to insist on the "truth" in all aspects of life. As an entering college freshman many years ago, I was convinced that "truth" would always win. In the interim years, this conviction has faced some serious challenges, and yet these verses are helpful in the day-to-day chaos and battle for our hearts, minds, soul, and strength: Isaiah 55:11; Deuteronomy 32:4-5; 2 Timothy 2:15; 2 Corinthians 10:4-5; 1 Peter 3:15.

Evolution and the Holocaust

Jonathan Sarfati

The atrocities of Hitler and the Nazis did not "just happen." Rather, they were a culmination of decades of teaching of evolutionary eugenics and racial superiority. It couldn't have happened without the undermining of the Judeo-Christian sanctity-of-life ethic, which depends on our creation in God's Image.

The Creationist's Silver Bullet: Information, Origins, and the Impossibility of Macroevolution

Thomas J. Foltz

Many approaches have been taken by creationists to cast doubt on the idea or means of macroevolution (molecules to man). Macroevolutionists have taken great efforts in an attempt to negate each one of the approaches by creationists. However, the "silver-bullet" by creationists has yet to be presented.

This presentation will provide a solution, a "silver-bullet," relating to the impossibility of macroevolution occurring by random chance and show why the creationist model is vastly superior and the only choice. The presentation will conclude on why the creationist model is the only valid solution and conclusion one can make. There is no third alternative. Illustrations from information and other technologies will be employed to show why macroevolution is without foundation, void, and impossible. Any and all approaches from the macroevolution position will be shown to be impossible. Hence, conclusions drawn from a macroevolutionary foundation will be false.

Over twenty (20) independent areas will be provided to illustrate the impossibility of macroevolution.

Genesis Model for the Origin, Variation, and Continuation of Human Populations

Joel David Klenck

A model is presented based on a comprehensive analysis of Biblical references for the origin, variation, and continuation of human populations. This paradigm is compared to a breadth of paleontological, bioanthropological, and archaeological evidence regarding human origins. The model provides a more comprehensive explanation for the array of human origins data, especially the (1) alleged evidence for the greater antiquity of anatomically modern human bones, (2) the temporal coexistence of modern and non-modern human populations such as *H. erectus* and Neanderthals, (3) variation in the morphological traits of human populations, and (4) the continuation of only modern human populations or *Homo sapiens sapiens* into the present Holocene period.

Reevaluation of Earth Age Using Hung's Geochronological Dating Model

Cheng Yeng Hung

The dispute between scientists and theologians on the age of earth has continued for years. The current age of the earth claimed by most geologists is 4.5 billion years, while Bishop James Ussher calculated it to be 6014 years, as of 2020, having been created on 4,004 BC. Recent studies conducted by RATE (Radioisotopes and the Age of the Earth) members concluded that the age of the earth is as young as only several thousand years. This discrepancy is caused partly by the traditional model currently used to calculate the age of earth, which has inherited a large number of errors. Hung's geochronological dating model uses numerical analysis to solve solute transport partial differential system equations and realistic parameters to avoid the errors inherited in the traditional model. This study utilizes Hung's model to reevaluate the age of the earth and presents the results of recalculation. The analysis first uses the age of the earth claimed by scientists to recalculate the equivalent field $^{206}\mathrm{Pb}/^{238}\mathrm{U}$ ratio. This calculated field $^{206}\mathrm{Pb}/^{238}\mathrm{U}$ ratio is then used to recalculate the age of the earth using Hung's geochronological dating model. The reevaluation shows the age of the earth should be 220,000 years old, which is much closer to the RATE members' conclusions. Therefore, the portion of the discrepancy between scientists and theologians on earth age due to the traditional model error is resolved.

Origins Research Group: Involving Current Students in Creation Research

Douglas A. Harold
and Lindsay N. Harold

In order to produce the next generation of creation scientists, it is vital that current students be involved in creation research before they graduate. Although many secular universities have student creation clubs that meet on campus, these organizations often do not conduct their own research and, as a result, do not actively engage students in creation-related research programs. There is a need for an organized effort that specifically involves both graduate and undergraduate students in significant and original creation research. Not only will this benefit the creationary cause in the future, but it will have the immediate benefit of providing current research scientists with a small, but energetic workforce of research assistants.

We propose to start an Origins Research Group at Virginia Tech with the following objectives: (1) recruit new creation scientists, (2) involve current creationists at Virginia Tech in creation science research, and (3) assist in or conduct our own creation research efforts with the goal of producing publishable results. The various steps and challenges involved in founding such a group will be discussed with the goal of motivating similar efforts at other universities and of soliciting advice from those in the audience with pertinent experience. If this effort is successful, this group—with its emphasis on student-conducted creation research—may be the first of its kind at any Tier 1 research university. Thus, the ultimate success of this effort is critical because it may serve as a model and test bed for similar research groups at other universities.

Concurrence between Science and the Bible on Our Immediate and Original Ancestors

Cheng Yeng Hung

The dispute between scientists and theologians on the origin of our ancestors has continued for years. Evolutionists claim that the species of our immediate ancestor, *Homo sapiens*, originated 250,000 years ago, and their original ancestors, archaic *Homo sapiens*, originated 300,000 years ago. On the other hand, Scripture reveals that our original ancestor is Adam, who was created by God and died 5,084 years ago. After Noah's Flood, the species of our original ancestor changed because of the change in the diet from the vegetarian to the meat eater and the loss of the radiation-protective hydrosphere. Therefore, our immediate ancestor is Noah's grandson, Arphaxad, who was born two years after the Flood and died 3,918 years ago. There is a large discrepancy between the year of origination of our ancestors claimed by the scientists and the year of our ancestor's death revealed in Scripture. This discrepancy is caused by the traditional model used to calculate the age of geological formation, which inherited large amounts of inadvertent errors. These errors can be eliminated by using Hung's geochronological dating model. When the ages of our ancestors are recalculated using Hung's model, the results show that our immediate ancestor should have originated about 3,800 years ago and our original ancestor 5,000 years ago. Therefore, there is concurrence between scientists' records and Biblical revelation on the age of our immediate and original ancestors.

Geographical Locations of Genesis Gardens

Joel David Klenck

Building on the contributions of Woodmorappe (1983) and Hallam (1973), all terrestrial plant and animal fossils were provenienced throughout the globe, incorporating data from four paleontological and paleobotanical databases and published references through May 2010. These assemblages were superimposed over maps showing major alterations in global terrain and correlated with a range of destructive events, including bolide impacts, volcanism, anoxic oceans, and glaciations. These data are used to evaluate the efficacy of biogeographical and ecological zonation and provide evidence as to the location and parameters of several antediluvian gardens.

Earnestly Contend for the Faith

Oscar Thorsland

We are living in a day and age when our Biblical foundations are being relentlessly attacked. These attacks are especially vicious in the creation-evolution wars. Remember that Darwinian evolution states that the random chance combinations of molecules over long periods of time have resulted in all the diverse life forms we see today. Along with this indoctrination concerning Darwinian evolution, society continues to hear the message that derides and ridicules any mention of creation and a Creator God. A recent quote from Dr. Arthur Caplan, the chairman of the Medical Ethics Department at the University of Pennsylvania, is typical of the anticreation message. He states that, "Creationism may pose the greatest threat to the future of our children, your health, and the nation's economy." This absurd and outrageous statement typifies the tragic and unscientific mind-set that is all too prevalent in most universities worldwide. As believers, we are living in a day and age when it is critical to obey our Creator's command to "earnestly contend for the faith." Of all the generations to inhabit the earth, we are the generation with the electron microscope and the Hubble telescope. This advanced technology has revealed the unfathomable complexity of life and of the universe. We, then, have no excuse for not coming to the conclusion that there is an awesome Creator and Scientific Mathematician who created and set everything into motion around us and directs the courses of all things. As the Psalmist said, we should be in awe when we observe the wonders of His creation. Three thousand years ago, King David of Israel wrote: "When I consider Your heavens, the work of Your fingers, the moon and the stars, which You have ordained; what is man that You are mindful of him?" (Psalm 8:3).

Genesis and the Gardens of God

Joel David Klenck

The first three chapters of Genesis state that the formation of a garden was a preferred methodology by God during Creation. Biblical references elucidate the classification of created groups of plants and animals at Creation, the association of certain taxonomic groups, and suggest the presence of at least three types of Biblical gardens. Correlations are proposed between these Biblical gardens and paleontological assemblages from alleged geological "eras." God's twin actions of (1) creating all plant and animal kinds in one week and (2) placing certain animal taxa with specific plant groups in gardens throughout the earth, provides a potential explanatory model for paleontological assemblages. Here, plant and animal kinds increasingly overlap their alleged temporal boundaries, and yet certain floral and faunal groups are commonly found associated with each other in geographical locales.

The Human Genome Defies Unguided Naturalistic Mechanisms of Evolution

Robert W. Carter

The human genome is a multidimensional, computationally intense operating system, the complexity of which dwarfs anything created by man to date. The Human Genome Project cost 3 billion dollars and managed to sequence the majority of the 3 billion letters in the genome. But just because we know the order of the letters *in one dimension* does not mean we know anything about how the genome operates. This is because the genome is a multidimensional construct operating in at least four dimensions. The first dimension is the linear set of letters and is mostly known. The second deals with the way sequences interact with each other (enhancers, promoters, repressors, DNA methylation enzymes, etc.). The third dimension is, literally, the 3-D structure of the genome. The structure of nuclear DNA impacts genetic expression in multiple ways. The fourth dimension is time. The genome is not static. The shape of the chromosomes changes during development and local regions are unpacked, dragged through the nucleus to specific centers of transcription, then packed away again, without ever forming DNA knots. This all depends on the needs of the cell for the activity of specific genes. In some species, the genome is heavily modified during development, with sequence deletion and rearrangement on a massive scale in various tissues and cell types. Where in the genome will we find the information that codes for this complex, multidimensional computer program that can self-modify and self-repair? The answer lies in those sequences that were once referred to as "junk DNA" but that have become a treasure trove for the modern geneticist.

A Theoretical Extension to Newtonian Gravitational Theory

Samuel R. Henderson

Newtonian Gravitational Theory, the most outstanding theory in the scientific field, was ushered into science with the highest of credentials. Yet Newton was initially reluctant to publish it. He withheld publication for some twenty years. He published it only at the insistence of a friend. The question arises: Why? Did he suspect a flaw?

After two centuries of highly successful application to science, Newton's theory was eventually found to be invalid for dynamic systems. The theory, which is flawless for systems whose secondary particle is at rest in space, was found to be inadequate when the motion of the secondary particle was calculated.

After a half century of intensive consideration, the answer to this mystery has appeared. The simplicity and commonsense nature of the correction of this flaw follows the lead of the original theory. In fact, by stranding on the shoulders of Newton, creation science can envision even greater truths than were visible to Newton. This paper identifies the flaw of Newton and, more importantly, offers a correction that finally resolves the conundrum of gravitational impulses moving at the speed c.

These truths will be presented in a three-part document as follows:

1. The Newtonian Theory as presented by Newton
2. The Henderson extension to the theory that corrects the flaw of Newton
3. The gross failure of relativity in correcting the flaw of Newton

The Paleolithic Archaeology of Palestine: A Biblical View

Raúl E. López

The Paleolithic archaeological and paleontological data for the Palestinian region has been examined. A series of changes in lithic technology and human fossil characteristics, progressing from the very simple to the complex and in the direction of closer anatomical resemblance to modern humans emerges from the data. These technological and physical changes appear to have occurred in parallel. Non-creationists explain these observations as resulting from a long evolutionary process. This paper attempts to develop a framework for the explanation of these data from a Biblical viewpoint.

A number of Biblical constraints can account for the observed progression in human forms and lithic industries. One determining factor was the technological bottleneck that undoubtedly reduced the descendants of Noah very quickly to a basic existential lifestyle. A technological rebound by progressively developing more effective tools to adjust to environmental post-Flood changes would have resulted in the observed increasingly complex industries.

Another key determining factor was the drastic reduction in longevity after the Flood. Life span appears to be related to anatomical morphology, with a tendency to more modern forms as longevity is reduced. Accordingly, a series of human forms gradually approaching modern characteristics would have developed. The changes in longevity could have arisen from the activation of preprogrammed controlling genes in the originally created genome by direct divine intervention or as a response to stressful environmental changes. Likewise, some other anatomical or physiological changes, not necessarily related to life span, also could have occurred. Adaptation through selection also could have produced genetic changes.

Looking for the "God Particle" at the Large Hadron Collider

Mary Beth De Repentigny

The Large Hadron Collider has begun colliding protons at the European Organization for Nuclear Research. Scientists' two main goals for this particle accelerator, dubbed "the world's most powerful hammer," are to look for both the Standard Model's Higgs particle and supersymmetry's sparticles. In this presentation, I will give theoretical background for the Higgs particle and show how the validity of the Standard Model of particle physics balances on its existence. I will delve into the fine-tuned hierarchy problem of the Higgs mass and show how the theory of supersymmetry was devised to solve this. Then I will highlight how supersymmetry unites elements of quantum theory with gravity into a theory of supergravity but then runs into the dilemma of its graviton spiraling out of control. Next I will show how string theory saves supersymmetry but in turn depends upon its landscape notion to explain away the fine-tuning of the apparently minute, but nonzero cosmological constant. An objective overview of these chain-linked theories shows that when the science of high-energy particle physics gets boiled down to its basic ingredients, scientists are left with a simple choice, namely to believe in the landscape of 10^{500} possible universes, or to believe in the divine Designer. Both options are a matter of faith.

Darwin's Deadly Legacy

Tom DeRosa

Darwin's ideas, when carried out, have had horrific consequences. It is proposed that these ideas were given "legs" to walk on by his dedicated disciples. They would carry them to a new dimension, which had the potential for the destruction of mankind. His disciples would be responsible for bringing evolutionary racist ideas to America and having them enforced through aggressive sterilization programs. The Carnegie Institute, Rockefeller Foundation, and IBM were all involved in the American Eugenics movement, which helped fuel the Nazis and led to the Holocaust. It will be strongly suggested that America, with its power brokers, its intellectually elite, and unscrupulous entrepreneurship, fuelled by a Darwinian ideology, have some degree of responsibility for the murder of millions.

Extrasolar Planets and Creation

Wayne Spencer

A brief review of the current state of research on extrasolar planets will be presented based on a review of the scientific literature. Evidence from Doppler measurements, exoplanet transits, and other recent findings will be used to argue that extrasolar planets do indeed exist. Extrasolar planetary systems have generally been found to be quite different from our own solar system, with large planets often very near the stars, planets sometimes in eccentric orbits, and even planets in retrograde orbits. Many of these findings have seriously challenged naturalistic planetary origins theories. New ideas have been suggested by the planetary science community, such as orbit migration, to deal with these challenges. A creation perspective suggests that these planets were created in the Creation Week and some of them may give indications of being of a young age.

Craniofacial/Dental Mutations in Zebrafish and Mice Disprove the Ability of Evolutionary Genetic and Developmental Biologic Models to Substantiate Functional Structural Intermediates in Craniofacial/Dental Evolution

Don Moeller

Recent laboratory experiments in developmental biology utilizing mutations in zebrafish and mice models have demonstrated the complete lack of potential useful and functional structures that could serve as potential functional intermediates in either the gradual or punctuated evolutionary models. The hundreds of genes now known to control the craniofacial structures also pose intractable problems for any directed or balancing selection models. Craniofacial/dental fossil evidence that would support any indication that the action of craniofacial/dental HOX genes (e.g., Msx 1, Msx-2 , Pax-6) were ever operant is also totally lacking. Morphological effects of genetic mutations acting on craniofacial/dental structures in large populations actually substantiates the incredible stability of the craniofacial/dental systems and its resistance to gradual mutational modification. This evidence supports the creation model. In addition, the lack of any fossil craniofacial/ dental developmental pathology supports both the recent creation and the absence of evolutionary processes.

The Origin of the Distinctive Patterns of Element Abundances in the Sun

Keith Davies

Astronomers have measured the relative abundances of over 70 elements that are present in the sun. The values of these abundances are not random. Instead, the observed patterns point toward the operation of a nucleosynthesis process or a series of nucleosynthesis processes that can be specified when the values of a small set of cosmological parameters are assigned to the primordial nucleosynthesis event. These parameters will define the state of matter at the beginning of primordial nucleosynthesis.

Studies by the astronomer Anthony Aguirre has revealed the existence of a set of cosmological parameters that will produce currently observed element abundance levels directly from the primordial nucleosynthesis event. He uses standard models for nucleosynthesis and cosmological development to show that the abundance distribution established in regions of the early cosmic medium can directly match the sun's currently measured metallicity

This is a remarkable result. The work of Aguirre has clear creationist implications.

Science Worldviews Impacting Science

Ronald C. Marks and William C. Lyon

Western culture exhibits confusion regarding the proper interaction of science and religion (or faith). This confusion impacts scientific and secular culture as well as the various religious subcultures. Ian Barbour has attempted to address the confusion by offering clarifying paradigms. His four paradigms (Conflict, Independence, Dialogue, and Integration) have been largely adopted as sufficient description of the ways in which the interaction is addressed. However, these paradigms represent a view "from the outside" of science and do not address the worldview of scientists. Scientists have attempted their own descriptions of the interaction of faith and science in the absence of understanding the impact of the resulting worldview on science.

Three scientific worldviews currently exist. A fourth is necessary to describe a Biblical worldview that includes a literal interpretation of Genesis. We propose that the progress of science is impacted by the worldview of the scientist and that different worldviews are associated with individual scientists' awareness of their own worldview and subsequent impact on science. Scientists at undergraduate and graduate schools in the southeast were surveyed regarding their worldview and the impact of worldview on science. The fourth worldview is proposed along with the initial assessment of scientists' attitudes regarding worldview impact on science.

The Universe in Real Time, Eclipsing Binaries and Their Light Time Effect

Ronald G. Samec, Bruce Oliver, and Danny R. Faulkner

At the last CRS 2009 meeting, Miller (CRSQ 46:235) presented a paper entitled, "Universe in Real Time." This paper suggests the possibility that we are actually observing the astronomical universe in near real time. Miller gives scriptural evidence for this proposal (Rev. 8:12). He envisions an envelope surrounding the solar system in which light travels at velocity c. But outside this envelope, the speed is near-infinite. He cites the existence of mature clusters of galaxies in deep space as further evidence for this.

Observationally, it is readily seen that the *light time* effect refutes this idea. We cite observations from the literature as well as our recent observations of FY Bootis, a very short period binary, which displays a sinusoidal orbital *light time* effect (an O-C curve). This *light time* effect is probably due to a close binary orbited by a third body, a dwarf star. Using Newton's form of Kepler's harmonic law, we find the dwarf has a mass of 0.2 solar masses and is orbiting in a circular orbit with a radius of ~3.6 Astronomical Units. Its orbital period is ~10 years. Assuming the system has an absolute magnitude near that of the sun (M_V=4.8) and an apparent V magnitude of 13.1 (from the SIMBAD data base), the star's distance is ~450 Parsecs (~1500 light years), far outside of the radius of our solar system (50 AU = 0.00024 Parsecs). If the scenario of the "Universe in Real Time" were true, the O-C curve should be a straight line instead of a sinusoid and we could not make the determination given above.

The Carbon Isotopes and the Strength of the Nuclear Force

Eugene Chaffin

Two of the carbon isotopes have particular interest. Carbon-14 is the one used in carbon dating and has a half-life of 5715 years. The decay of C-14 by beta decay is not a "forbidden transition," yet we find this long half-life. I discuss possible reasons for this and discuss the absence of appreciable paring interactions in C-14 as a reason why the half-life of C-14 is not very sensitive to variations in the strength of the nuclear force. Carbon-12 is a stable isotope, but an excited state of C-12 is thought to be responsible for an appreciable enhancement of the so-called triple-alpha process in the interiors of stars. Without this enhancement stars could not manufacture elements heavier than carbon. The creationist implications are discussed.

Is the Flood Memorialized in the Constellations?

Danny R. Faulkner

There are many theories for the origin of the constellations. One explanation popular with many Christians is the so-called "gospel in the stars." This theory has a number of problems, and while recently researching the subject, I found an interesting suggestion by Richard Proctor, a nineteenth-century popularizer of astronomy. He proposed that several of the constellations may have been established as a memorial to the Genesis Flood. We will explore this theory.

It's a Young World After All

Richard Overman

This is an overview of the issues surrounding the age of the earth. The paper reviews radiometric dating from a scientific perspective by exploring whether the radiometric dating techniques are consistent and reliable. The paper also provides an overview of the results of the extensive study on radiometric dating performed by the Creation Research Society and the Institute for Creation Research entitled "Radioisotopes and the Age of the Earth (RATE)." Finally, the Biblical evidence for the age of the earth is reviewed along with some interesting observations about the passing down of documentation from Adam to Abraham. The paper wraps up with a song that summarizes the paper in 3 verses.

Dinosaur Tracks, Eggs, and Bone Beds Explained Early in the Flood

Michael Oard

Despite being able to explain many big-picture observations of the rocks and fossils, there are still a few hundred challenges to the Flood model of earth history. One of these challenges is the existence of billions of dinosaur tracks, millions of dinosaur eggs, and scavenged bone beds that seem to imply too much time to have happened early in the Flood. However, the examination of the bone beds, tracks, and eggs indicate many unusual features for a uniformitarian environment. Such observations from all across the world suggest that another, catastrophic hypothesis is needed. A hypothesis will be presented to explain the dinosaur data. This is the BEDS (Briefly Exposed Diluvial Sediments) hypothesis, which postulates that after rapid sedimentation, the distance between the top of the sediment and the Floodwater surface became shallow. Such sediments then become vulnerable to exposure by local drops in relative sea level caused by five mechanisms that would have operated during the early Flood. Dinosaurs swimming in the water or from higher refuges then would walk on BEDS and lay eggs, only to have these features covered during a local rise in relative sea level. Because there could be hundreds of sea level oscillations at different amplitudes and periods, there could be multiple layers of tracks and eggs at any one location. The BEDS hypothesis also explains a number of other seemingly puzzling features associated with dinosaur tracks and eggs, as well as others not associated with them.

Men, Memes, and Metaphysics

Stan G. Smith

Human consciousness represents a drastic departure from any materialistic definition of man. Although neuroscience desperately searches for a materialistic connection, consciousness and chemistry are different in kind. Memetic theory, proposed by Dr. Richard Dawkins, affirms this difference even if he and others attempt to represent this phenomenon as another kind of Darwinian (materialistic) replicator distinct from genetic operation. Nobel Laureate John Eccles, affirmed this dualism to the point of suggesting the operation of a soul particle within the brain. Dualism is not generally accepted by modern materialists in the scientific community. However, perhaps something about the way humans reason might convincingly disclose the reality of some kind of "quantum of consciousness." Mathematics represents a high-water mark in human reasoning and appears to illustrate a level of abstraction that challenges materialism. One so-called "meme" in particular might be potential evidence for dualism and serve to open the door to a metaphysical reality—the meme of "infinity."

Preliminary Geomorphology of the Uinta Mountains and its Implications

Michael Oard

The Uinta Mountains provide evidence for Flood runoff. As the Uinta Mountains uplifted and massive erosion occurred, a large, gravel-capped pediment formed along the north and south side of the uplift. This pediment, called the Gilbert Peak erosion surface, bevels rocks of all ages within the uniformitarian geological column (used for discussion purposes only). The "gravel" up to large boulder size is called the Bishop Conglomerate and is commonly composed of red Uinta Group Quartzite from the heart of the mountains. Pediments are not being formed today but are being destroyed. They are readily explained by fast Floodwater flowing parallel to the mountain range. After forming, the Gilbert Peak erosion surface was greatly dissected by subsequent erosion, which must have occurred late in the Flood.

Waters gaps are common in the Uinta Mountains. These water gaps are also nearly impossible to explain by uniformitarianism but can be readily explained by Flood runoff. The pediment and water gaps were formed during the Cenozoic and therefore the Flood/post-Flood boundary is in the late Cenozoic in this area. The pediment also caps sedimentary rocks of the Green River and Bridger Formations, making these formations Flood formations.

Evaluation of the Ar/Ar Dating Process

Richard Overman

During the last half of the twentieth century the Argon-Argon method of dating geologic rocks and formations became very popular. This method replaced K/Ar as the method of choice for many types of rocks. This paper explores the fundamental mathematics of the Argon-Argon dating method and evaluates the impact of the assumed date of the "standard sample" on the calculated Argon-Argon date. An apparent impact is observed. A method for testing the validity of an Argon-Argon date is proposed with example evaluations. The paper also postulates ways that Creation scientists can appropriately and effectively use the $^{40}Ar/^{39}Ar$ dating techniques to understand the earth's history from a Biblical perspective. This paper is a follow-up to a paper accepted for publication in CRSQ and contains a more complete proposed research plan.

A Gene Family Designed for Mutation to Allow for Adaptation

Jean Lightner

Mutations in a gene affecting coat color, the MC1R, allow for interesting and adaptive changes in coloration. This receptor normally responds to two different signal molecules to turn on or leave off the production of the darker pigment eumelanin. The receptor can be modified to remain on, remain off, or be more or less sensitive to the two signaling molecules depending on the location of the mutation. Other genes in this rhodopsin family of receptors share a similar structure, and several have been identified with mutations that can be adaptive. This includes olfactory receptor genes, the rhodopsin gene, and the dopamine receptor D4 gene. These observations suggest that some genes were designed to be able to change to allow for adaptation/specialization. The patterns of change show that nonrandom processes are involved, suggesting designed mechanisms are involved in producing at least some of these mutations.

Minutes of the 2010 Creation Research Society Board of Directors Meeting

(above) **CRS Board Members. Pictured from left to right. Back row: Jean Lightner, Ted Aufdemberge, Kevin Anderson*, Diane Anderson*, Mark Armitage, Michael Oard, Ronald Samec, Russ Humphreys, Gene Chaffin, Gary Locklair, Danny Faulkner. Front row: Glen Wolfrom, Don DeYoung, David Kaufmann (*CRS Professional Staff)**

The forty-seventh annual Creation Research Society (CRS) Board of Directors (BOD) meeting was held 17–19 June 2010, at the Holiday Inn Express, Prescott, Arizona, and the CRS Van Andel Creation Research Center (VACRC), Chino Valley, Arizona. Present were Mark Armitage, Ted Aufdemberge, Gene Chaffin, Don DeYoung, Danny Faulkner, Russ Humphreys, David Kaufmann, Jean Lightner, Gary Locklair, Michael Oard, Ron Samec, and Glen Wolfrom. Unable to attend were John Reed and David Rodabaugh.

President Don DeYoung called the first session of the general BOD meeting to order at 19:05 on Thursday, 17 June 2010. He noted, and the members agreed, that it is a privilege to serve the CRS. President DeYoung outlined the logistics for the weekend: general BOD meeting on Thursday, committee meetings on Friday at CRS VACRC, the second session of the general BOD meeting on Saturday, and a CRS supporter banquet and reception Saturday evening in Phoenix. Don shared a letter from former BOD member Emmett Williams. The BOD thanked Emmett for his years of service. Don also shared a letter from BOD member John Reed, who was unable to attend due to health issues.

President DeYoung noted an error in the 2009 minutes of the BOD. This statement is incorrect: "President DeYoung shared that we are the oldest creation organization and the only one doing research." Recording secretary Gary Locklair apologized for the miswording, which should read, "We are the oldest creation organization dedicated to doing research." Gary moved that the minutes of the 2009 BOD meeting be approved as printed in the Winter 2010 issue of the CRSQ as amended. Motion was approved

Glen Wolfrom, on behalf of the recording secretary, reported the results of the 2010 BOD elections. Two hundred and one ballots were received, and the following were elected to a three-year term: Don DeYoung, Russ Humphreys, Gary Locklair, and Ron Samec. A list of future candidates suggested by the membership was presented. Some comments from voters follows: "All good men," "Keep up the good work," and "I am thankful for the service of all current board members."

President DeYoung reminded BOD members of their duties, and especially of our obligation to support and encourage our professional staff, including Kevin and Diane Anderson and Becky Wolfrom. The BOD thanked our professional staff for their dedicated work. Don noted that CRS income has dropped due to the downturn in the economy. We need to be especially mindful of spending, and we need to target a 10% decrease in the expense budget for the coming year. Discussion ensued by the BOD regarding finances.

Financial secretary Mark Armitage noted that we will likely overspend our expense budget by just a little this year. At the same time our spendable endowment funds have been depleted.

Treasurer Danny Faulkner noted that a well-received "star party" was held the previous night. Danny also reported that the CRS conference in South Carolina held last July was a "big bang success." This CRS conference is a different kind of meeting; there is no creation meeting quite like it. There were 75 participants and 24 presentations, with lots of interaction. The BOD thanked Danny for his hard work in putting this together and making it possible.

VACRC director Kevin Anderson provided the BOD with an update of his activities, including his desire to find some outside employment to reduce the society's expenses and ensure the financial viability of the CRS. Mike Oard mentioned he will be "fine-tuning" the CRS display at the AIG museum. Dates and locations for future BOD meetings were discussed. The first session of the BOD meeting adjourned at 20:30.

Friday 18 June was devoted to committee meetings at the CRS VACRC in Chino Valley. The Internet, membership, periodicals, and publications committees met in the morning, with constitution, finance, lab, and research committees meeting in the afternoon. Over lunch the CRS accountant, Darlene, outlined some issues related to the society's 990 and noted the need for detailed minutes. In addition, John Reed was recognized for 10 years of service to the BOD, while retiring member Dave Kaufmann was recognized for 26 years of service to the BOD. Former BOD member and VACRC director John Meyer was able to join us and contribute to our meetings. Friday evening, the BOD dined at Windmill Farm.

The second part of the general BOD meeting convened at 08:20 on 19 June 2010. Kevin Anderson's devotion focused on Genesis 1:1 and Matthew 16:15. These verses indicate God's power and show why nothing is impossible. Scripture also shows that the enemy (gates of hell) is on the defensive, not us. We can challenge and reenergize the church, as this is a spiritual battle. An encouraging note from George Howe was read. Mike Oard noted the good response to CRS's Yellowstone road guide.

Constitution committee chairman Dave Kaufmann reported that BOD members have received position descriptions. Members should review these for currency and accuracy, update these as appropriate, and return them to the recording secretary. Official CRS documentation (e.g., constitution, bylaws, etc) should be reviewed by all BOD members. A discussion of the CRS archives and what should be included ensued. Gary Locklair is the liaison between the CRS and the archives as held by the Concordia Historical Institute (St. Louis, MO). Gary reported on his work with the archives.

Internet committee chairman Gary Locklair reported on matters relating to the CRS Web site and CRSnet. A steady growth in both was noted. Consistent with the economy, online sales were down 10% from the previous year. The BOD thanked its webmaster, Fred Williams, and his assistant, Tony Massey, for their valuable service to the society.

Mike Oard will coordinate book specials for CRSnet members with Fred Williams. BOD members on CRSnet were encouraged to recommend a book to use for these specials. The Internet committee recommended that the CRS have an official presence on Facebook. The motion to maintain this presence by the recording secretary was approved.

John Meyer made a presentation about working with Steve Miller and a local camp. The BOD approved a motion to instruct Kevin, Diane, and John to work with the camp to provide star parties and use Steve Miller as an official "astro-ambassador" on behalf of the CRS.

Don DeYoung, chairman of the lab committee, reviewed the state of the VACRC lab campus, including the issue of proposed water pipeline across the property. Don indicated our lab facility is in good condition. The arrangement with Mark Armitage was fine-tuned, as was our scanning electron microscope. The committee will recommend a modest increase in salary for our employees.

Glen Wolfrom, membership committee chairman, reported on a decrease of 95 members in the last two years. He noted that 45% of new members are retained into the second year. There was some discussion over the term "subscriber." The term "nonmember subscriber" will be used in its place. Glen noted that donations sent along with membership renewals are also down. He reminded the BOD that the cost of publications is not covered by membership fees; the cost of producing our publications has historically been supplemented by donations. A number of suggestions promoting membership were discussed. The BOD approved a motion to grant a life membership to any member who solicits 10 new members or nonmember subscribers. That same motion provided a CRS shirt for any member who solicits 5 new members or nonmember subscribers. (The new members or nonmember subscribers must be individual, and not institutional, users.) Glen was commended for his colorful report.

Periodicals committee chairman Gene Chaffin shared that Glen Wolfrom will continue editing *Creation Matters* along with the assistance of Jean Lightner. Glen reported on the status of *Creation Matters* as it enters its fifteenth year of publication. The BOD commended Glen on the quality of contributions and the popularity of *Creation Matters*. Kevin Anderson shared that volume 46 of the *CRSQ* has been completed with a number of interesting articles. As editor, Kevin is open to suggestions for ways to improve the Q. He reported that a switch to a different printer a year ago is working well. The BOD commended Kevin for his work and the quality of the Q.

President DeYoung commented on CRS financial issues. He challenged BOD members to take a leadership role in supporting the society. Locations for upcoming BOD meetings were discussed. The fiftieth annual meeting in 2013 requires a special venue. It was noted that a total solar eclipse over the US in 2017 might provide a unique opportunity for a meeting location.

Publications committee chairman Mike Oard indicated we did not sell as many books this year ($42K as opposed to $52K the previous year). At the same time, the publications committee was below expense budget. *Rock Solid Answers* was published, with all royalties going to CRS and not the authors. The Zion/Bryce road guide is now available. Mike is exploring two additional publishing options, one of which is online publishing. CRS bore the expense of publishing the catalog. This year the *CRSQ* CD will be updated and published, perhaps for the last time. A discussion ensued on avenues for increasing book sales.

Gene Chaffin, research committee chairman, reported on several research projects this year, including Mark Armitage's research on diatoms, George Howe's work on yuccas, and Peter Klevberg's research on the Little Ice Age. Research policies were summarized. The committee approved new work by Mike Oard (Uinta mountains) and Mark Armitage. The committee will gladly accept research endowment monies.

Treasurer Danny Faulkner presented information about fiscal year 2009–2010. Because of the timing of the BOD meeting, Danny presented the previous 12 months of income and expenses, which should provide good data for analysis. Danny estimated $300K of income with $330K of expenses.

Financial secretary Mark Armitage reported on the society's financial holdings. The funds held by the society showed a 5.8% return on investment, even in this down economy. He put forth a number of proposals related to the naming and use of funds. Some of the changes were to ensure compliance with state and federal law. Mark indicated there is no such thing as a "spendable" endowment fund in practice, as we are using all funds proportionally. Mark reiterated the sobering news of this year's deficit.

Treasurer Faulkner and financial secretary Armitage led discussion related to the 2010–2011 budget. The following committee budget requests were approved: research—$25,000; periodicals—$50,000; publications—$45,670; membership—$12,000; constitution—$500; VACRC—$151,755-$169,550; finance—$0; Internet—$900; executive/treasurer—$14,000. It was approved to operate with an expense budget of $320,820–$299,825 for fiscal 2010–2011. (The variable rate of the VACRC budget depends upon the status, full- or part-time, of a professional staff member.)

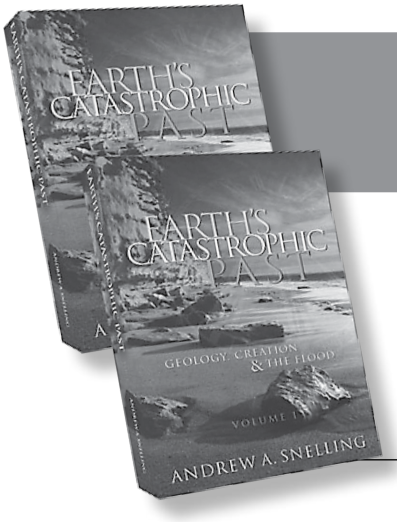
The board submitted the names of Danny Faulkner, Mike Oard, Thomas Hennigan, and Robert Hill as candidates for the 2011 board of directors election. There are three openings to be filled.

Election of board officers was held. Don DeYoung was elected president, Gene Chaffin was elected vice-president, and Gary Locklair was elected recording secretary. The following were confirmed for the second year of their three-year term: Glen Wolfrom as membership secretary, Mark Armitage as financial secretary, and Danny Faulkner as treasurer. (Their service will be confirmed annually.)

President DeYoung, on behalf of the BOD, thanked Becky Wolfrom for her 25 years of service to the society with a certificate.

While the meeting was adjourned at 12:05, board members traveled to Phoenix in order to participate in the CRS banquet held at the Hilton Garden Inn beginning at 18:00.

Respectfully submitted,
Gary Locklair
CRS Recording Secretary



Book Review

Earth's Catastrophic Past, Volumes 1 and 2

by Andrew Snelling

Institute for Creation Research, Dallas, TX, 2009, 1102 pages, $60.00.

According to the preface of this book, author Snelling was approached by Dr. Henry Morris in the 1990s to write an updated and revised version of "The Genesis Flood," the classic 1961 text that Morris coauthored with John Whitcomb. Snelling, a committed creationist since his youth and a Ph.D. geologist with mining industry experience in Australia, has more than risen to the challenge, and I believe Dr. Morris would be very proud of this work were he still alive today.

The book, which weighs in at a hefty 1102 pages, is broken up into two volumes. The first deals with the theology of Genesis and addresses forcefully and masterfully the common objections that many evangelicals have to a literal interpretation of Genesis. The first volume also gives a framework for Biblical geology and presents a summary of the modern geologic synthesis. Snelling's overall methodology is to divide earth history into four periods of time: Creation Week, the period before the Flood, the Flood of Noah, and the post-Flood period, with most geologic work occurring during the Creation Week and the Flood. There are roughly two camps in creationist geology, those who believe that plate tectonics and the conventional geologic column can be integrated into a creationist synthesis and those who have doubts about such a proposition. Snelling falls into the former camp, so he is devoted to "parceling out" conventional geologic ages into a Biblical framework. For example, much of the Precambrian igneous record is attributed to the period of the Creation Week. Snelling infers that Precambrian sedimentation is fossil-free because it occurred as a result of the creation of dry land on Day Three, before plants and animals had been created. He is also a proponent of "Catastrophic Plate Tectonics," positing that runaway subduction of oceanic plates was responsible for much of the orogenic events of the Flood.

The second volume delves more deeply into a technical appraisal of the rock record, and gives a Biblical geological model for the formation of the earth, going over in more detail the four periods of time mentioned above. Snelling covers fossilization, coal formation, metamorphism, production of the different types of sedimentary rocks, and radiometric dating; and addresses many challenges posed to the YEC paradigm by conventional geologists including tracks, nests, evaporites, varves, ice ages, caves, and granite formation.

Snelling's knowledge is formidable, his writing style is clear and very understandable, and the book is impeccably referenced. Among the things I learned:

- Organic samples from every portion of the Phanerozoic display detectable amounts of C-14, even in the standard radiocarbon literature (V. 2, p. 859).
- Invariably, where two or more radioisotope "dating" methods have been applied to the same rock unit, different "ages" have been obtained (V. 2, p. 839). Snelling himself dated four Grand Canyon samples using four different radioisotope methods on each sample, and found that alpha-decaying parent isotopes always yielded older "ages" than the beta-decaying parent isotopes. Snelling concludes that apparent ages of igneous rocks are reflections of the isochron age of the mantle source, not of the time of emplacement.
- The Santana Formation of Brazil may be the finest fossil locality in the world, with fossil fish so well preserved in carbonate concretions that it is often concluded fossilization must have been instantaneous (V. 2, p. 544). Prima facie evidence includes the fact that the secondary lamellae of fish gills are found intact, with very little sign of collapse, indicating that fossilization was completed in probably less than five hours.

- All the trees whose remains are found in Carboniferous coal seams, or associated with them, are either hollow or lightly built structures (V. 2, p. 557). Snelling proposes that the fossil plants and animals found in coal beds are actually the buried remnants of a gigantic floating forest that was destroyed by the Flood and did not reappear afterward.
- Extensive compilation of measured paleocurrent direction indicators in the Paleozoic and Mesozoic strata of the geologic record on all continents reveals that during the deposition of these rocks, the water currents all around the globe were flowing in one direction: more or less east to west (V. 2, p. 701).
- Pre-Flood biogeography may reflect different ecosystems, resulting in stratigraphic separation of fossils—for example, a hydrothermal biome of stromatolites adjacent to hot springs, a gymnosperm-dinosaur biome, and an angiosperm-mammal-man biome (V. 2, p. 730). Interestingly enough, Joel Klenck proposes a similar creation of different "gardens" on earth in an as-yet-unpublished article, based mainly on analysis of the original Hebrew text of Genesis.
- If the earth's atmosphere had no helium when it formed, and the helium accumulated in the atmosphere at the current estimated rate, then the present density of helium in the atmosphere would have accumulated in less than 1.8 million years (V. 2, p. 889).
- There are Cambrian sands, clays, and silts that are nearly as unindurated and little cemented as they were in the days of deposition (V. 2, p. 913).
- Explosive blooming of coccolithophores could have created massive chalk oozes that would have entombed ammonites and other sea creatures, and is a valid theory for the deposition of worldwide chalk layers (V. 2. P. 928).
- Modern reefs are not a good analogy for ancient "reef" systems, which display cross-bedding and mixtures of carbonate mud and broken skeletal particles floating in the mud matrix (V. 2, p. 935).
- Bedded salt deposits are more consistent with formation by hydrothermal precipitation than with quiet evaporation (V. 2, p. 944). Interested readers can also see Heerema (2009) for an alternative magmatic model of salt deposition.
- No modern lake deposits have the thin laminations displayed in the Green River oil shales (V. 2, p. 948).
- Metamorphic mineral assemblages may be the result of differences in mineralogy, not of different temperature-pressure conditions (V. 2, p. 2008).
- Present modeling of the processes of formation of ore bodies require an extremely narrow time frame (V. 2, p. 1020).
- Granitic plutons such as the Sierra Nevada are better explained by magma ascent through vertical dike systems, followed by lateral spreading into tabular bodies and vertical thickening (V. 2, p. 990). The world's granitic plutons are mostly tabular in shape and typically only a few kilometers thick.

In my opinion, this is a landmark book and a serious contender for the definitive young earth geology position. I do not agree with everything Snelling proposes—for example, he attributes the bulk of oil deposits to organic decay, a theory I question. I am also not as confident as he that the geologic column is a useful correlation for a Biblical chronology.

Snelling also makes what appears to be an inaccurate statement on p. 759 of V. 2, where he says that "fossil mammals are used as index fossils to define the various biostratigraphic stages in Tertiary strata, and to correlate these strata between sedimentary basins on all the continents." According to the website of the International Commission on Stratigraphy (http://stratigraphy.science.purdue.edu/gssp/index.php?parentid=2), the indicators of the various stages of the Cenozoic are all either chemical, magnetic, or foraminiferal.

Lastly, I have reservations about certain aspects of plate tectonic theory, but Snelling is much more knowledgeable than I am, and certainly his advocacy of mainstream geologic positions, interpreted in a young earth context, should give him a hearing among conventional geologists.

I believe Snelling's book is a must-have for any serious young earth advocate.

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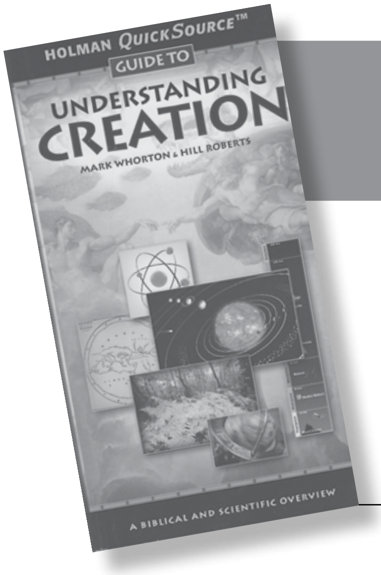
HOLMAN QUICKSOURCE™
GUIDE TO
UNDERSTANDING
CREATION
MARK WHORTON & HILL ROBERTS
A BIBLICAL AND SCIENTIFIC OVERVIEW

Book Review

Holman Quick Source Guide to Understanding Creation

by Mark Whorton and Hill Roberts

Holman Reference, Nashville, TN, 2008, 375 pages, $15.00.

This beautifully illustrated volume covers a wide range of topics relevant to one's understanding of Creation. While Creation in a broad sense is the focus of this work, it is more a handbook on the general question of origins. The authors attempt to be inclusive when broaching topics such as the age of the universe, the sequence of Creation events, and the extent of the Flood.

While never referred to by name, the position of the Creation Research Society is often presented in this tome but is never the preferred option. When assessing the recent Creation view, we find this statement, "The greatest objection to this view is that it conflicts with impressive scientific evidence, thus requiring one to regard virtually all of modern science as fundamentally mistaken not just about the age of Earth but about most of the findings and principles that have made modern technologies possible" (p. 187).

Commenting on the extent of the Flood, the authors opine, "We believe the flood was as big as God wanted it to be" (p. 167). But when evaluating the geologic effects of this event their view is anything but global.

The history of our movement is thought to be captured in one paragraph:

> Flood geology has its roots in the teachings of the Seventh Day Adventist prophetess Ellen G. White, who taught that Noah's global flood was responsible for the geological column and the fossil record. Her teachings were advanced by Harry Rimmer and George McReady Price. Both of these men were largely uneducated and had no advanced training in science and yet they published books on flood geology that were readily embraced by many Christians. Then theologian John C. Whitcomb collaborated with civil engineer Henry Morris in *The Genesis Flood: The Biblical Record and Its Scientific Implications*, published in 1961. In this book Whitcomb and Morris aim to give theological and scientific credibility to the concepts advanced by Rimmer and Price (p. 245).

This book is recommended only as a reference work for current thinking about non-Biblical alternatives to young earth creationism.

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Letters to the Editor

The policy of the editorial staff of CRSQ *is to allow letters to the editor to express a variety of views. As such, the content of all letters is solely the opinion of the author, and does not necessarily reflect the opinion of the* CRSQ *editorial staff or the Creation Research Society.*

Making Fossils

I recently read the article in volume 47, number 1 of *CRSQ* entitled “Can a Laboratory Make an Authentic Fossil?” It concerned the attempt to simulate the fossilization process with current organisms. The article described the process of taking two euthanized blennies and placing them in a pail of soft mud for two years. The results were predictable, as any aquarium owner could have told you. I happen to own a 200-gallon aquarium and am used to calculating the weight of water when positioning and setting up my tank. The experiment in question appeared to disregard what I consider to be a dominant factor in fossilization, namely pressure. Some consideration was given to the chemistry of the environment. But any creation scientist would have to consider pressure from a global flood in the fossilization process.

Now water weighs about 8.34 lbs per gallon. A cubic foot of water is about 7.48 gallons. It would exert about 62.4 lbs of pressure on one sq ft of surface, or about 0.43345 PSI. The global Flood was supposed to cover the highest mountain top. That would be Mount Everest, which is currently 29029 ft in height above sea level. Granted, mountain heights can change, but it still gives us an approximation. It is hard to say how high above the mountaintop the water rose, so I will simply take it to the crest. At land surface at current sea level, the pressure applied to a dead organism would have been 29029ft x 0.43345 PSI, or about 12583 PSI. A pail of mud could not begin to simulate this pressure, but perhaps a hydraulic press could come closer. The pressure would have to be applied to the water, not mud or silt. This would tend to equalize the pressure on all sides of the dead organism. We do not wish to simply crush it. It would be buried in the silt or mud at the bottom of the tank, which would be filled with water, with pressure applied to the water from the top.

Fossils have been found all over the world. The chemical environment simply would not have been homogenous worldwide. So while certain chemical conditions might need to be experimented with, I do not see this as the dominant factor in the fossilization process. Fossils have been found in a variety of geochemical environments. They are, in a sense, a form of sedimentary rock. Pressure has long been known to play a role in the formation of sedimentary rock. Perhaps this experiment has already been attempted. If so, I would love to know what the results of it were.

Regards,
Brian Jones

An Excellent and Frightening Article

The recent article, "A Genesis Model for the Origin, Variation, and Continuation of Human Populations" by Joel D. Klenck (CRSQ 47:111–137) was excellent and frightening. I am so thrilled that someone finally had the fortitude to confront the absurd notions that non-modern humans are products of great age (Cuozzo), rickets and syphilis (Lubenow), and chewing (Custance), and that these populations were all post-Flood Babel races.

Klenck treated their views, I feel, with a bit too much restraint. Cuozzo's and Custance's views make NO sense as the morphological traits of Neanderthals and *H. erectus* are found in very young skeletons and cannot be caused by great age. Furthermore, how could all the post-cranial differences, awesome strength, and ability to hunt enormous predators in Neanderthals be related to chewing?! Klenck is so right to point out that the effects of rickets and syphilis are degenerative diseases. You don't turn into a Neanderthal if you contract rickets.

That non-modern humans are a product of Babel is really ridiculous. How many Neanderthals or other non-human bones do you find in Neolithic or Bronze Age deposits or burials today? NONE. To state that non-modern humans represent post-Flood populations shows a lack of knowledge of the requisite subjects.

I for years have wondered at the ludicrousness of these theories but was worried that there were no other possible answers. That Klenck found the answer in, of all places we should have looked, *the Bible*, is slightly embarrassing and yet so very wonderful. The Biblically-based Genesis model that he provides conforms to all lines of data, especially genetic evidence.

Accordingly, I have been troubled for several years by creationist geneticists who want others to believe (who really don't know better) that Neanderthals and modern humans are genetically identical. In recent articles, Robert Carter has tried to convince the creationist community that Neanderthals are modern humans (2010). His analyses are full of misleading and false assertions.

Breaking down Carter's comments (2010), he states:

(1) Neandertals are well within the range of diversity of modern man.

No! The studies showed that only some of the genetic material in Neanderthals are within the range of modern man. Some of their genetic material are NOT present in modern human populations at all.

(2) The Neandertal genome is incredibly similar to the genome of modern man.

This is a misleading statement. Neanderthal and modern humans have similar genomes; chimpanzees and humans also have similar genomes. However, similarity does not prove unity. Just because genomes are similar does not mean they are from the same species. Carter ignores the dissimilarities in the genomes between Neanderthal and modern human populations. His statements attempt to gloss over these important genetic differences to try to convince the creationist community that Neanderthals could come to "your family Reunion!" That's just wrong and so false. He should know better.

(3) There are only a few fixed differences between modern man and Neandertals.

But Carter knows that even a "few" fixed differences between genomes cause pronounced differences between two populations. These differences translate into morphological and behavioral differences, which cannot be ignored, glossed over, or cast aside like Carter is trying to do.

Then Carter unbelievably states the following:

> So, not only are Neandertals fully human, but the evidence is that they interbred with the ancestors of modern Europeans, Asians, Australians, and Native Americans, but not Africans. Thus, Neandertals are either the cousins or the ancestors to people outside Africa.

His reference to his staggeringly one-sided statement is Gibbons (2010). Did Carter read the same article? Gibbons's article remarks on several genetic similarities, which Bob trumps up, but then goes on to state the genetic differences between Neanderthals and modern humans, which Carter completely ignores.

The Genesis model (from Klenck) assumes that Neanderthals and modern humans were both derived from Adam and therefore should share much genetic ancestry. The model also suggests that there occurred an event that introduced genetic material that would make Neanderthals and all other non-modern humans different from *Homo sapiens sapiens* or people of today.

This fact is exactly what we see in genetic data from Neanderthals. Although the latter do share genetic material with modern humans, their genomic data also shows several startling differences that are NOT present in humans today (see Green et al., 2008; 2010).

Klenck is correct to point out the skeletal and cultural (and moral) differences between modern and non-modern human populations. Non-modern humans were 3 to 5 times stronger than modern humans, matured as early as 8 years of age, were faster, smarter, hunted large game with ease, are associated with much evidence for cannibalism, had cuts and contusions all over their skeletons, and died at younger ages—compared to *H. sapiens* skeletons. All this data should have provided the creationist community with the first warning that we were dealing with Nephilim populations.

Instead, manuscripts by Lubenow and Carter, I believe, have lured us into sleep that all human populations are "cousins" or "family members." Meanwhile, the satanic evolutionary community is busy trying to bring back the Nephilim with an unholy mix of stem cells, Neanderthal genomes, and modern human female eggs.

While Lubenow and Carter encourage us to focus on the "unity, solidarity, and equality of the human family" (Lubenow, 2004, p. 158), no one bothered to consider the Biblical verses about pre-Flood human populations, the descriptions of the Nephilim in Genesis 6, or the absolutely frightening efforts and commitment of evolutionists to bring non-modern human populations back to life.

As the evolutionists are committed to this evil plan, Lubenow and Carter are in a sense ignoring the actions of evolutionists, who desire to clone "a peer group" (!) of Neanderthals (Zorich, 2010, p. 41). The comments from George Church, a professor of genetics at Harvard Medical School, are shocking. Church admits to being part of a team developing a technique to enhance genome alterations, with the intent of cloning Neanderthals, to profit from advancements in gene therapy and other medical applications (Zorich, 2010, pp. 36–37).

I'm glad that someone finally figured it out and sounded the alarm. Klenck's timely article is Biblical, precise, and absolutely frightening.

J. Hooper
Indio, CA

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Supporting Klenck's Model

The recent article by Joel Klenck, "The Genesis Model for the Origin, Variation, and Continuation of Human Populations" (*CRSQ* 47:111–137) was very surprising. When I read the article the first time, I expected to pick it apart from the standpoint of Biblical exegesis, but I was mistaken. I believe Klenck provides a Biblically founded and well-argued exegesis concerning the Nephilim and pre-Flood human populations. I think he is correct. However, I wanted to mention another verse that he missed that seems to help his model.

God Himself counters the association between the post-Flood sons of Anak and the pre-Flood Nephilim in Numbers. The report by the evil spies mentions that the sons of Anak lived in Hebron (Numbers 13:22). The passage also states that the twelve spies collected fruit from the Valley of Eschol, which is the valley that encompasses Hebron (Numbers 13:23–24). Countering the evil report's correlation between the sons of Anak and the Nephilim, God says to Moses in Numbers 14:25:

"*Now, the Amalekites and the Canaanites dwelt in the valley.*"

Canaanites were post-Flood populations from Canaan, through Ham (Genesis 10:6). Amalekites were post-Flood descendants of Esau, through Eliphaz (Genesis 36:10–12). For God to state that the sons of Anak, from Hebron in the Valley of Eschol, were from post-Flood Amalekite and Canaanite populations refutes the allegation (of the ten spies) that the sons of Anak were from pre-Flood Nephilim populations. Moreover, this statement by God lends more biblical credibility to Klenck's proposal that Nephilim were populations that existed only before the Flood.

Sincerely,
Simon Cuthbertson

More Evidence for Klenck's Model

"A Genesis Model for the Origin, Variation, and Continuation of Human Populations" by Joel Klenck (2010) was excellent. In one article, Klenck provided the Biblical explanation for all human fossil sites, the reasons for their morphological and cultural differentiation, and the mortality of all humans other than *H. sapiens* before the Holocene. His article was like an armed revolt against the theory of human evolution.

His article was also prophetic. The author cited the earliest modern human remains accepted by evolutionary scientists as the Omo River Valley remains, dated to around 200,000 years ago. Since the discovery of the Omo assemblage and the acceptance of Klenck's article for publication (on October 18, 2010), two startling discoveries have been made. First, on October 25, 2010, evolutionists announced that modern human remains (*H. sapiens*) were found at Zhiren Cave in China in contexts dated to 100,000 years ago (Kaufman, 2010). This confirms that modern humans and *H. erectus* populations overlapped each other and were contemporaneous. Second, and even more surprising, was the announcement on December 30, 2010 that modern human remains were retrieved from Qesem Cave, dating to *as early as 400,000 years ago* (Herskhovitz et al., 2010). These remains have caused evolutionists to doubt if modern humans evolved from populations in Africa, as these *H. sapiens* remains were found in Israel. These two findings very much bolster Klenck's arguments as he predicted that modern human remains would to be found in increasingly earlier contexts and reflect differences between non-Nephilim and Nephilim populations.

In light of the Genesis model and the recent discoveries that strengthen the author's conclusions, the entire scientific community (both creationist and evolutionist) would be well served to look at the data that Klenck mentions and the claims of these mostly evolutionists (!) citing the discovery of modern human remains from the earliest contexts at their sites.

Although the author cites numerous sources during the twentieth century, he did not mention crucial evidence that strengthens his model from the nineteenth century and early 1900s.

- Modern human (*H. sapiens*) lithic assemblages utilizing flake technology with an assortment of choppers, retouched flakes, scrapers, and awls from Baraque Michel, Bay Bonnet, and Boncelles, Belgium from Oligocene contexts with considerable faunal remains dated at the latest to 26 million years ago (Rutot, 1907).
- The *H. sapiens* skeletons found in Pliocene contexts (4 to 3 million years ago) at Castenedolo, Italy (Ragazzoni, 1880).
- Cut marks on the bones of an extinct sea cow, *Halitherium*, from a Middle Miocene deposit (19 to 12 million years ago) from Pouance, France (de Mortillet, 1883, p. 54).
- *H. sapiens* mandible from Late Pliocene deposit (2.5 to 2 million years ago) at Foxhall, England (Osborn, 1921, p. 568).
- *H. sapiens* skeleton from Late Pliocene strata (4–3 million years ago) with lithic tools and faunal remains from Savona, Italy (Deo-Gratias 1873, pp. 419–420).

These sites and their assemblages also support the Genesis model and should be added to his analyses.

After doing such as unique work on early human fossils, I wonder if the author could provide a Biblically based model explaining Australopithecine remains. I look forward to Klenck's next well-thrown spear against the theory of evolution.

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Electronic submissions of all manuscripts and graphics are preferred and should be sent to the editor of the *Creation Research Society Quarterly* in Word, WordPerfect, or Rich Text Format (see the inside front cover for address). Printed copies also are accepted. If submitting a printed copy, an original plus two copies of each manuscript should be sent to the editor. The manuscript and copies will not be returned to authors unless a stamped, self-addressed envelope accompanies submission. If submitting a manuscript electronically, a printed copy is not necessary unless specifically requested by the *Quarterly* editor. Manuscripts containing more than 35 pages (double-spaced and including references, tables, and figure legends) are discouraged. An author who determines that the topic cannot be adequately covered within this number of pages is encouraged to submit separate papers that can be serialized.

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Manuscripts shall be computer-printed or neatly typed. Lines should be double-spaced, including figure legends, table footnotes, and references. All pages should be sequentially numbered. Upon acceptance of the manuscript for publication, an electronic version is requested (Word, WordPerfect, or Rich Text Format), with the graphics in separate electronic files. However, if submission of an electronic final version is not possible for the author, then a cleanly printed or typed copy is acceptable.

Submitted manuscripts should have the following organizational format:

1. Title page. This page should contain the title of the manuscript, the author's name, and all relevant contact information (including mailing address, telephone number, fax number, and e-mail address). If the manuscript is submitted by multiple authors, one author should serve as the corresponding author, and this should be noted on the title page.

2. Abstract page. This is page 1 of the manuscript, and should contain the article title at the top, followed by the abstract for the article. Abstracts should be between 75 and 200 words in length and present an overview of the material discussed in the article, including all major conclusions. Use of abbreviations and references in the abstract should be avoided. This page should also contain at least five key words appropriate for identifying this article via a computer search.

3. Introduction. The introduction should provide sufficient background information to allow the reader to understand the relevance and significance of the article for creation science.

4. Body of the text. Two types of headings are typically used by the *CRSQ*. A major heading consists of a large font bold print that is centered in column, and is used for each major change of focus or topic. A minor heading consists of a regular font bold print that is flush to the left margin, and is used following a major heading and helps to organize points within each major topic. Do not split words with hyphens, or use all capital letters for any words. Also, do not use bold type, except for headings (italics can be occasionally used to draw distinction to specific words). Italics should not be used for foreign words in common usage, e.g., "et al.", "ibid.", "ca." and "ad infinitum." Previously published literature should be cited using the author's last name(s) and the year of publication (ex. Smith, 2003; Smith and Jones, 2003). If the citation has more than two authors, only the first author's name should appear (ex. Smith et al., 2003). Contributing authors should examine this issue of the *CRSQ* or consult the Society's web site for specific examples as well as a more detailed explanation of manuscript preparation. Frequently-used terms can be abbreviated by placing abbreviations in parentheses following the first usage of the term in the text, for example, polyacrylamide gel electrophoresis (PAGE) or catastrophic plate tectonics (CPT). Only the abbreviation need be used afterward. If numerous abbreviations are used, authors should consider providing a list of abbreviations. Also, because of the variable usage of the terms "microevolution" and "macroevolution," authors should clearly define how they are specifically using these terms. Use of the term "creationism" should be avoided. All figures and tables should be cited in the body of the text, and be numbered in the sequential order that they appear in the text (figures and tables are numbered separately with Arabic and Roman numerals, respectively).

5. **Summary.** A summary paragraph(s) is often useful for readers. The summary should provide the reader an overview of the material just presented, and often helps the reader to summarize the salient points and conclusions the author has made throughout the text.

6. **References.** Authors should take extra measures to be certain that all references cited within the text are documented in the reference section. These references should be formatted in the current *CRSQ* style. (When the *Quarterly* appears in the references multiple times, then an abbreviation to *CRSQ* is acceptable.) The examples below cover the most common types of references:

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7. **Tables.** All tables cited in the text should be individually placed in numerical order following the reference section, and not embedded in the text. Each table should have a header statement that serves as a title for that table (see a current issue of the *Quarterly* for specific examples). Use tabs, rather than multiple spaces, in aligning columns within a table. Tables should be composed with *14-point type* to insure proper appearance in the columns of the *CRSQ*.

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Special Sections

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Submission of letters regarding topics relevant to the Society or creation science is encouraged. Submission of letters commenting upon articles published in the *Quarterly* will be published two issues after the article's original publication date. Authors will be given an opportunity for a concurrent response. No further letters referring to a specific *Quarterly* article will be published. Following this period, individuals who desire to write additional responses/comments (particularly critical comments) regarding a specific *Quarterly* article are encouraged to submit their own articles to the *Quarterly* for review and publication.

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Occasionally, the editor will invite individuals to submit differing opinions on specific topics relevant to the *Quarterly*. Each author will have opportunity to present a position paper (2000 words), and one response (1000 words) to the differing position paper. In all matters, the editor will have final and complete editorial control. Topics for these forums will be solely at the editor's discretion, but suggestions of topics are welcome.

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All book reviews should be submitted to the book review editor, who will determine the acceptability of each submitted review. Book reviews should be limited to 1000 words. Following the style of reviews printed in this issue, all book reviews should contain the following information: book title, author, publisher, publication date, number of pages, and retail cost. Reviews should endeavor to present the salient points of the book that are relevant to the issues of creation/evolution. Typically, such points are accompanied by the reviewer's analysis of the book's content, clarity, and relevance to the creation issue.

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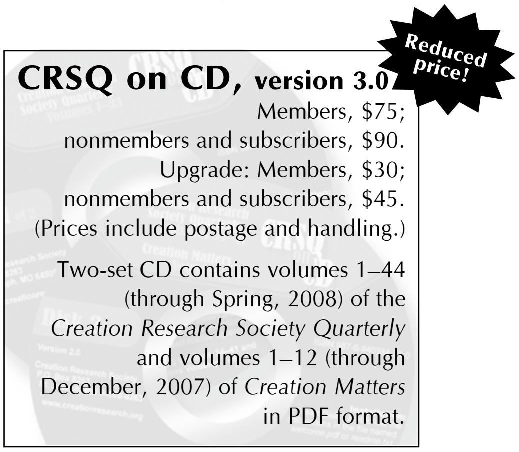

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Creation Research Society

History—The Creation Research Society was organized in 1963, with Dr. Walter E. Lammerts as first president and editor of a quarterly publication. Initially started as an informal committee of 10 scientists, it has grown rapidly, evidently filling a need for an association devoted to research and publication in the field of scientific creation, with a current membership of over 600 voting members (graduate degrees in science) and about 1000 non-voting members. The *Creation Research Society Quarterly* is a peer-reviewed technical journal. It has been gradually enlarged and modified, and is currently recognized as one of the outstanding publications in the field. In 1996 the *CRSQ* was joined by the newsletter *Creation Matters* as a source of information of interest to creationists.

Activities—The Society is a research and publication society, and also engages in various meetings and promotional activities. There is no affiliation with any other scientific or religious organizations. Its members conduct research on problems related to its purposes, and a research fund and research center are maintained to assist in such projects. Contributions to the research fund for these purposes are tax deductible. As part of its vigorous research and field study programs, the Society operates The Van Andel Creation Research Center in Chino Valley, Arizona.

Membership—Voting membership is limited to scientists who have at least an earned graduate degree in a natural or applied science and subscribe to the Statement of Belief. Sustaining membership is available for those who do not meet the academic criterion for voting membership, but do subscribe to the Statement of Belief.

Statement of Belief—Members of the Creation Research Society, which include research scientists representing various fields of scientific inquiry, are committed to full belief in the Biblical record of creation and early history, and thus to a concept of dynamic special creation (as opposed to evolution) both of the universe and the earth with its complexity of living forms. We propose to re-evaluate science from this viewpoint, and since 1964 have published a quarterly of research articles in this field. *All members of the Society subscribe to the following statement of belief*:

1. The Bible is the written Word of God, and because it is inspired throughout, all its assertions are historically and scientifically true in all the original autographs. To the student of nature this means that the account of origins in Genesis is a factual presentation of simple historical truths.
2. All basic types of living things, including humans, were made by direct creative acts of God during the Creation Week described in Genesis. Whatever biological changes have occurred since Creation Week have accomplished only changes within the original created kinds.
3. The Great Flood described in Genesis, commonly referred to as the Noachian Flood, was a historical event worldwide in its extent and effect.
4. We are an organization of Christian men and women of science who accept Jesus Christ as our Lord and Savior. The act of the special creation of Adam and Eve as one man and woman and their subsequent fall into sin is the basis for our belief in the necessity of a Savior for all people. Therefore, salvation can come only through accepting Jesus Christ as our Savior.

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